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CATALOGUE No., 1875.

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ALEX. WILSON & Co.,

ENGINEERS,

VAUXHALL IRON-WORKS, WANDSWORTH ROAD,

LONDON, S.W.

MANUFACTURERS OF

SINGLE AND DOUBLE CYLINDER SCREW ENGINES,

**HIGH-PRESSURE AND SURFACE CONDENSING,**

FOR YACHTS, LAUNCHES, TUGS, AND LIGHTERS;

WITH BOILERS OF VERTICAL, RETURN TUBE, LOCOMOTIVE, AND OTHER TYPES.

**THE "EXCELSIOR" DIRECT-ACTING STEAM PUMP,**

SIMPLE AND COMPOUND.

THE VAUXHALL DONKEY-PUMPS for Feeding Boilers.

STATIONARY STEAM-ENGINES AND BOILERS.

STEAM, HYDRAULIC, AND HAND CRANES AND HOISTS.

STEAM STOP-VALVES, &c.

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1875.

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# INTRODUCTION.

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In presenting this Illustrated Catalogue to our numerous Customers at home and abroad, we would call special attention to the fact, that in addition to illustrating our various Special Manufactures as copiously as possible, we have always endeavoured to give the greatest possible details in regard to Dimensions, Weights, and Prices, all arranged in Tabular Price Lists convenient for reference. Our great object has been to save our Customers the trouble of first communicating with us to ascertain these particulars, which leads to so much delay in the case of Machinery required in foreign countries. For the information of our numerous customers in all parts of the world, we beg to remark that we keep many of our manufactures largely in Stock or in progress, for the purpose of enabling us to give quick delivery; and in any case, when we do not happen to have the Machinery thus in Stock or in progress, we can, by means of our extensive and varied plant, generally execute our Orders promptly.

We have confined ourselves to a few leading Specialities, instead of ranging through the wide and varied field of Modern Mechanical Engineering, and have thus, as well as by Special Tools and keeping our workmen steadily employed, effected a considerable saving in the cost of manufacture. We do not, however, pretend to say that our Machinery is the cheapest that can be had, because we have built up our business on the principle that sound and sufficient material, combined with good workmanship, should always be our first consideration. In conclusion, we would call attention to the fact that good Machinery is the most profitable investment that can be made, while bad Machinery is one of the worst, as the result of one break-down may, in a manufactory, result in the loss of many times the value of the Machine.

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ESTIMATES FOR EVERY DESCRIPTION OF MACHINERY ON APPLICATION. EXPERIMENTAL AND PATENT  
MACHINERY CONSTRUCTED.

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## TERMS.

First Orders should be accompanied with Remittance or Reference.

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Delivery is Free in London at any Dock, Wharf, or Railway Station, except when otherwise specified.

All Packing Cases are charged for at the lowest possible rate, and are allowed for in full only when returned carriage-paid and in good condition.

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## VAUXHALL DONKEY-PUMPS.

The great success which has attended the introduction of the "*Vauxhall Donkey-Pumps*" has convinced us that they only require to be better known among Engineers to extend their application; as we are sure the Pumps recommend themselves by their excellence and moderate price. [4500 of these Pumps have now been sold, and 100 per month are now being manufactured.]

The "*Vauxhall Donkey-Pumps*" have now stood the test of many years' practical work, the demand for them has steadily increased year by year, and they are now recognized by all the leading engineers in every country where steam power is used as a most reliable fitting to a Steam Boiler. We would call special attention to the fact, that of our total sales more than 90 per cent. has been to the trade; and this result has been attained solely by our strict attention to the quality of our materials and workmanship; while, by the large demand, enabling us to employ special machinery in their construction, we are enabled to sell them at a price which no other Manufacturer can attempt to approach. Several attempts have been made to introduce similar Pumps, but they have *gradually* disappeared, and we are now the only leading Manufacturers of such Pumps in this country. Purchasers on the Continent are cautioned against purchasing an inferior imitation of these Pumps, now being manufactured in Germany. None are genuine unless purchased from our Works direct, or from our accredited Agents with our name attached.

The Giffard Injector is not so generally employed as was supposed it would be when it was first introduced, as it is found to be too delicate for ordinary usage; and in spite of all the improvements that have been made on it, it is not yet an infallible Boiler feeder with bad water and careless treatment, whilst it cannot be repaired by an ordinary mechanic. Since the expiry of the original "Giffard's" Patent, the price of these Injectors has been reduced to one-half, and a great number of modifications have been brought out by various Manufacturers, and as a consequence the quality of workmanship has been very much reduced; the result being that owing to the reliability of our Pumps, the demand for them has enormously increased. Since the introduction of this Donkey Pump, many Engineers have ceased to put Pumps on their Steam Engines, because it is better to have the feed pump close to the Boiler, and thus save the long lengths of feed pipe, which are always leaking and bursting, whilst the feed apparatus is brought more directly under the control of the stoker. As Engines for special purposes, running at a very high speed, are coming into extensive use, it is absolutely necessary to dispense with the feed pump on them, as it would wear out very soon when worked at such a speed. A Donkey Pump also dispenses with the necessity of running the large Engine during meal hours, merely to get a little water in the Boiler. There are many other purposes to which these Pumps can be applied, and they are especially useful wherever liquids or semi-liquids require to be forced, such as in Breweries, Distilleries, Gas Works, Chemical Works, &c.

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## VAUXHALL DONKEY-PUMPS.

FIG. 1.

FIG. 2.

### DESCRIPTION.

Fig. 1 represents a section of the No. 6 single-action Pump, and Fig. 2 a section of the No. 10 double-action Pump; Fig. 3, on the following pages, shows all the Pumps from No. 4 to No. 12 in elevation. It will be seen that the steam cylinder is cast in one piece with the water cylinder. These two cylinders being bored at the same time, and with the same boring bar, always have their axes perfectly in the same line. In the single-action Pump, the steam piston is cast in one piece with the piston of the Pump, and is of the best gun metal; the glands being of the same material. Gun metal is preferred, because it absorbs less power in friction, and is not so liable to rust if the Pump is standing for any length of time. The fly wheel, which only

serves to carry it over the dead centre, is of moderate dimensions; it is driven by a connecting rod, which works on a cross head, fixed on the piston rod; this cross head is guided by a round bar, which unites the Pump to the steam cylinder. The bearings of the fly-wheel shaft are of gun metal, and are fixed on the cover of the steam cylinder; the valve is worked by an eccentric fixed on the end of the shaft; and this eccentric moves the valve by means of a slotted link made in one piece with the valve rod. The double action resembles the single action, except that the piston rod is made of steel. No. 4 to No. 6 are made with a simple slide valve. No. 7 to No. 12 have piston valves working in a gun-metal tube, as shown in the engraving. The workmanship, owing to the division of labour employed, is of the best description; the workmen being able to attain great excellence through being always engaged on one detail.

The speed of these Pumps varies from 180 strokes per minute for No. 4, to 80 for No. 12; they can pump boiling water, if care is taken to have the tank from which the water is drawn placed above the level of the suction valves, and also to work the Pump at a moderate speed.

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## VAUXHALL DONKEY-PUMPS.

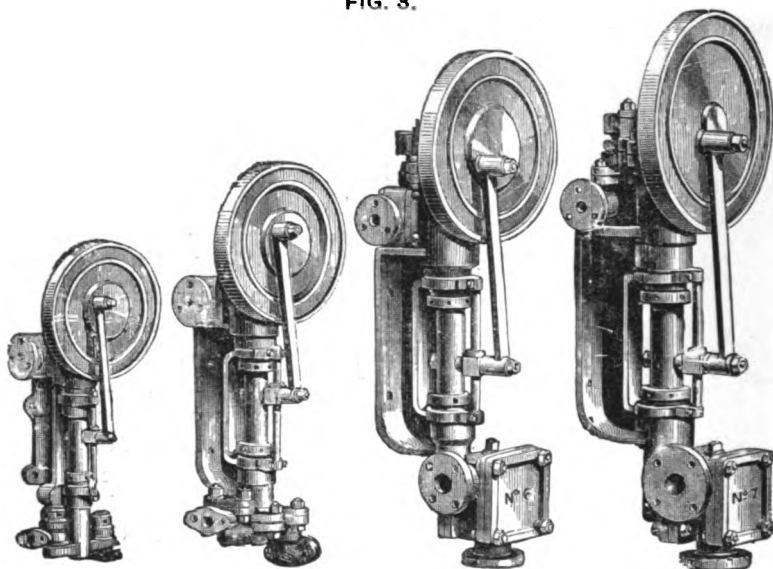
300 OF THESE PUMPS ARE ALWAYS IN PROGRESS, AND A LARGE STOCK ALWAYS READY PACKED.

*Every Pump is carefully Tested before leaving the Works.*

SAME SIZES OF PUMPS ARE ALSO MADE OF SPECIAL PROPORTIONS AND STRENGTH TO WORK AT FROM 100 TO 200 LB. PRESSURE, AT A COST OF 50 PER CENT. EXTRA. THEY ARE ALSO MADE WITH RAMS REDUCED IN DIAMETER TO WORK AT A PRESSURE OF LESS THAN 20 LB.

FIG. 3.

STOP VALVES,  
CHECK VALVES,  
AIR VESSELS,  
FLANGES and PIPES  
ARE SUPPLIED  
AT  
MODERATE PRICES.



SIZES OF PUMPS.	No. 4.	No. 5.	No. 6.	No. 7.	*No. 8.
Diameter of Steam Cylinder, inches ..	2 $\frac{1}{8}$	2 $\frac{1}{2}$	3 $\frac{1}{8}$	3 $\frac{3}{4}$	3 $\frac{3}{4}$
Diameter of Pump, inches .. ..	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{7}{8}$	2 $\frac{1}{4}$	2 $\frac{1}{4}$
Stroke, inches .. .. .	2 $\frac{1}{2}$	3	4	4	4
Diameter of Steam Pipes, inches .. ..	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$
Gallons thrown per hour .. .. .	100	150	250	400	700
Horse-power of Boiler supplied .. ..	8	12	20	30	50
Diameter of Water Pipes, inches .. ..	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$
DIMENSIONS of Packing { Length ..	28	32	39	40	43
{ Breadth ..	12	14	16	17	17
Cases, inches .. .. { Depth ..	12	14	16	16	16
Net weight of Pump, lbs. .. .. .	48	78	150	175	215
Total weight, lbs. .. .. .	63	100	194	234	278
Price of Packing Case .. .. .	3s. 6d.	4s. od.	5s. od.	6s. 6d.	7s. od.
Price of Pump, delivered in London ..	£7 10s.	£10 os.	£13 os.	£15 os.	£17 10s.

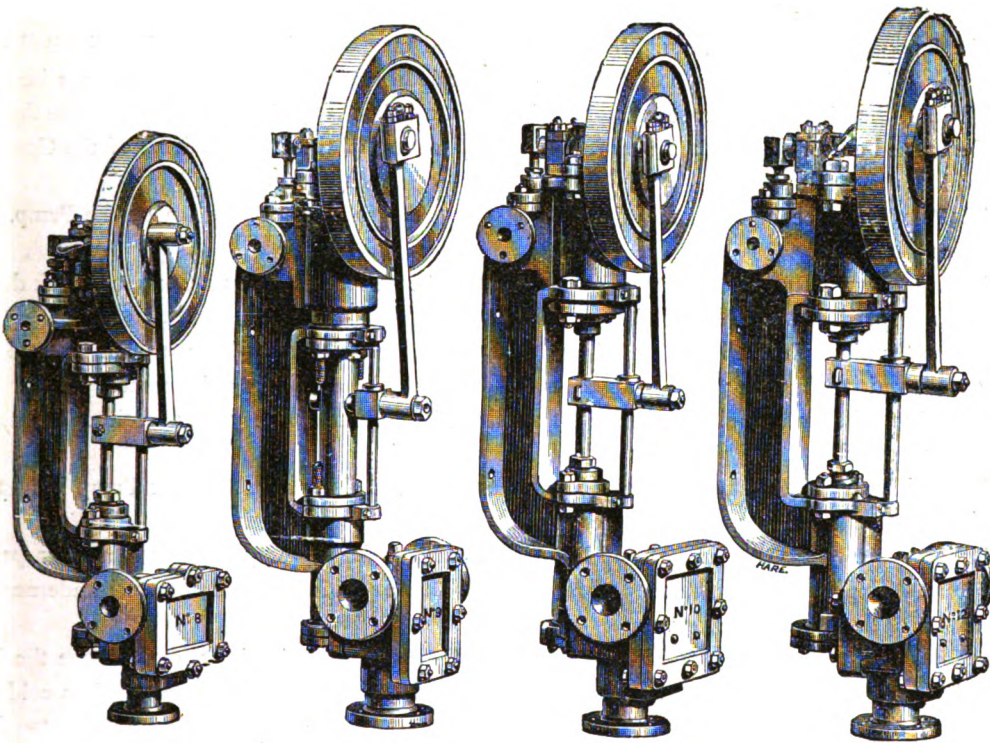
Cast Iron or Indiarubber Valves supplied free of charge, when required, instead of the usual Gun Metal ones.

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# VAUXHALL DONKEY-PUMPS.

WILL FORCE WATER AT A TEMPERATURE OF 200°.

FIG. 3.



SIZES OF PUMPS.	No. 9.	*No. 10.	*No. 12.	*No. 14.	*No. 15.	*No. 16.
Diameter of Steam Cylinder, inches	4 $\frac{1}{8}$	4 $\frac{1}{8}$	4 $\frac{5}{8}$	5 $\frac{3}{4}$	6 $\frac{1}{2}$	8
Diameter of Pump, inches .. ..	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	2 $\frac{1}{2}$	3	3 $\frac{3}{4}$
Stroke, inches .. .. .	6	6	6	9	10	12
Diameter of Steam Pipes, inches. ..	1	1	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2
Gallons thrown per hour .. ..	900	1500	1800	3000	4000	7000
Horse-power of Boiler supplied ..	60	100	120	200	300	500
Diameter of Water Pipes, inches ..	2	2	2 $\frac{1}{4}$	3	3 $\frac{1}{2}$	4
DIMENSIONS of Packing { Length ..	48	53	56	67	72	81
{ Breadth ..	20	20	22	28	30	36
{ Depth ..	19	19	20	29	32	33
Cases, inches .. .. .						
Net weight of Pump, lbs. ....	314	330	460	1120	1680	2352
Total weight, lbs. ....	402	418	572	1260	1932	2630
Price of Packing Case .. .. .	8s. od.	9s. od.	12s. od.	15s. od.	20s.	24s. od.
Price of Pump, delivered in London	£20 os.	£22 10s.	£30 os.	£45 os.	£55 os.	£65 os.

\* Nos. 8, 10, and 12 are double action. For design of Nos. 14, 15, and 16, see Fig 4.

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## VAUXHALL DONKEY-PUMPS.

### DIRECTIONS FOR FIXING AND WORKING.

The Pump must be placed upright, or nearly so, and may be bolted to a wall, to the Boiler itself, or to any other convenient support. It is recommended to use a piece of wood from 2 in. to 4 in. thick behind the Pump, and care must be taken that this bed is perfectly level, otherwise the Pump may be twisted out of shape when screwed up, and jamming of the ram and firing of the Connecting Rod will be the result.

All Pipes *must* be of the same diameter as the corresponding connection on the Pump. (For Prices see List.)

A Screw-down Valve should always be used for the Steam Regulator, as a Common Cock does not regulate the speed so well. (For Prices see List.)

The water pipes should be as straight as possible, and no elbows or knees should be used under any consideration whatever; Bends alone should be used, the cost being the same. An Air Vessel adds greatly to the smooth, silent, and steady working of the Pump. They may be either of Cast Iron or Copper, according to the pipes used. (For Prices see List.)

A Check Valve is necessary where the water enters the Boiler, as it allows the Pump Valves to be examined while steam is up. (For Prices see List.)

All joints are sent out made with red lead alone, which under ordinary pressures ensures a perfectly tight joint. Under no circumstances whatever must Gasket or Indiarubber be used underneath the Top Cover of the Steam Cylinder.

In forcing water at  $212^{\circ}$  it is necessary to have the Supply Tank about 10 ft. above the Pump, lower temperatures in proportion. Hot water cannot be pumped at the same speed as cold; time must be given for it to flow through the Valves. Care must be taken not to run the Pump too fast, as the slower it works the better it is for lessening wear and tear. An Air Vessel should always be used when forcing hot water.

When water is drawn from any depth, a foot valve should be used to keep the pipe always full. (For Prices see List.)

When water has to be drawn above 12 ft., the double-action Pump should be ordered with Leather Pistons and Indiarubber Valves (no extra charge), when they will draw from a depth of 25 ft. The smaller Ram Pumps should never be made to draw from more than 15 ft. to 20 ft. For feeding Boilers at low pressures of about 10 lb. to 15 lb., special Pumps can be made at an extra cost of 5 to 10 per cent. Cast-iron Valves, &c., for Chemical purposes are supplied without extra charges. When the Pumps are employed in raising water, they will force it 2 ft. high for every lb. of Steam Pressure in the Boiler by which they are worked.

When at work care must be taken that the working parts shall not suffer from want of Oil. When they are fixed in stoke holes, or otherwise exposed to grit, they should be enclosed in a wooden case, and kept as clean as any other piece of Machinery. Care must be taken not to screw down the Glands too tightly or all on one side by tightening one nut more than the opposite one. Care must also be taken that the Bearing behind the Fly Wheel is never allowed to get loose.

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*Price List of Fittings, Pipes, &c., required for fixing the Vauxhall  
Donkey-Pumps.*

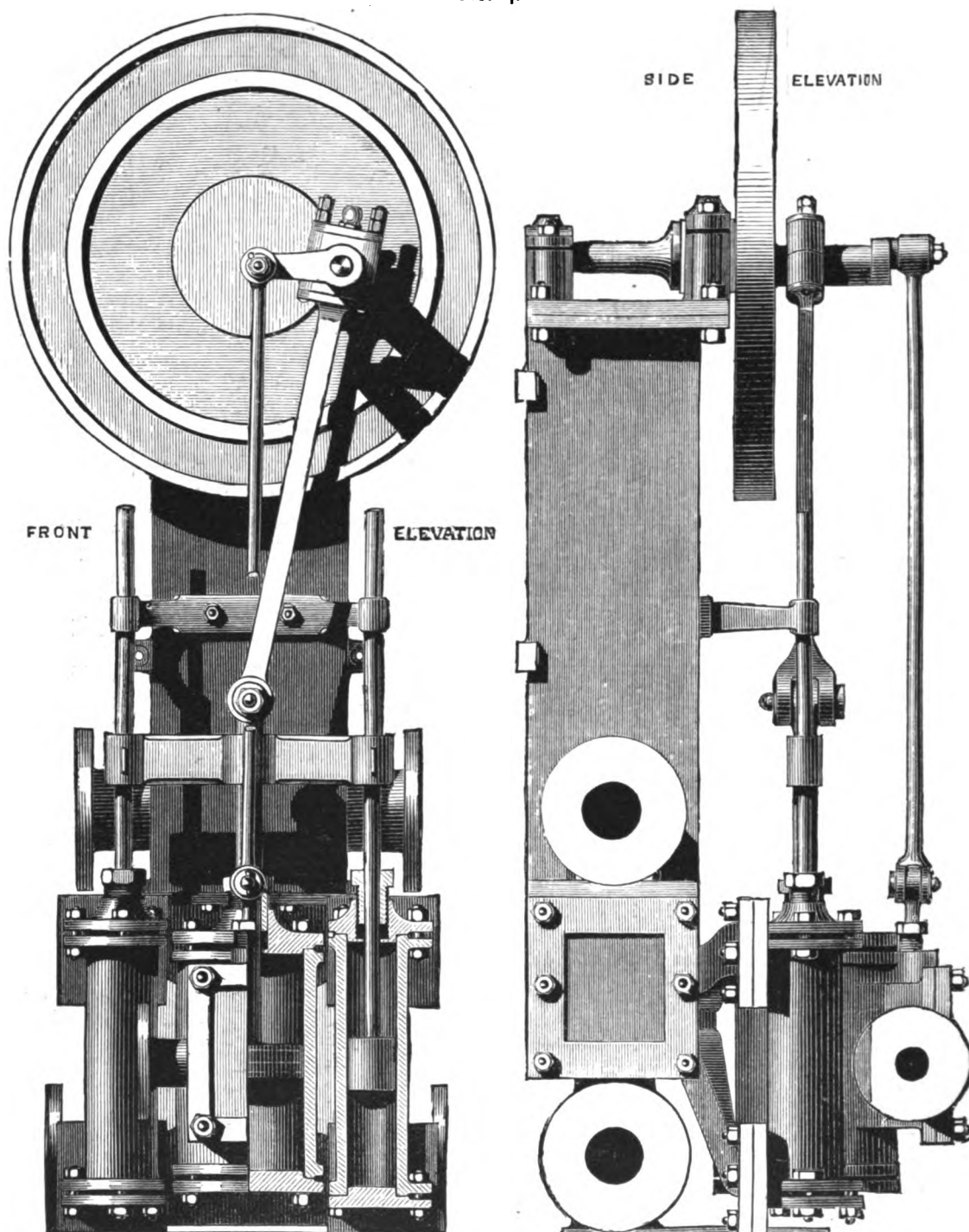
NUMBER OF DONKEY PUMPS.	4	5	6	7	8	9	10	12	14	16	18
Price of Pump .. .. .	£7 10	£10	£13	£15	£17 10s.	£20	£22 10s.	£30	£45	£55	£65
Extra if made to work by hand ..	15/0	18/0	22/0	25/0	25/0	34/0	34/0	40/0	..	..	..
Packing Case of Pump .. .. .	3/6	4/0	5/0	6/6	7/0	8/0	9/0	12/0	15/0	20/0	24/0
Copper Air-Vessel to braze to Copper Pipes ..	25/0	30/0	37/6	55/0	65/0	75/0	75/0	85/0	*	*	*
Cast-Iron Air Vessel with Flanges .. .. .	7/0	9/6	14/0	17/6	17/6	21/0	21/0	24/0	*	*	*
Steam Stop-Valve of Gun Metal with One Flange, and Fitted to Pump with Bolts }	8/6	10/0	12/6	15/0	15/0	17/6	17/6	22/6	22/6	27/6	40/0
Check Valve of Gun Metal .. .. .	15/0	22/6	30/0	35/0	35/0	47/6	47/6	65/0	70/0	90/0	120/0
Check Valve in Cast-iron Case .. .. .	..	..	25/0	27/6	27/6	37/6	37/6	50/0	60/0	75/0	90/0
Foot Valve for Suction Pipe .. .. .	12/6	15/0	17/6	20/0	20/0	25/0	25/0	30/0	35/0	42/0	50/0
Steam and Exhaust Flanges, fitted to Pump with Bolts }	4/0	4/0	6/6	6/6	6/6	8/0	8/0	8/0	10/0	12/0	14/0
Suction and Delivery Flanges, fitted to Pump with Bolts .. .. .	6/6	6/6	9/6	10/0	10/0	13/0	13/0	16/0	21/0	28/0	32/0
Steam and Exhaust Pipes, per foot .. .. .	0/3½	0/3½	0/4½	0/4½	0/4½	0/6	0/6	0/6	0/8	0/10½	1/4
Suction and Delivery Pipes, per foot .. .. .	0/4½	0/6	0/8	0/10½	0/10½	1/4½	1/4½	2/0	3/4	4/2	5/3
Steam and Exhaust Bends, each .. .. .	0/6	0/6	0/9	0/9	0/9	0/11	0/11	0/11	1/4	1/8	3/2
Suction and Delivery Bends, each .. .. .	0/8	0/11	1/4	1/8	1/8	3/2	3/2	5/0	12/0	18/0	24/0

\* Air Vessel not required for these.

*See Directions for Fixing on previous page.*

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FIG. 4.



Pumps Nos. 14, 15, and 16 are made to this design. For Prices, &c., see Table under Fig. 3. Description on next page.

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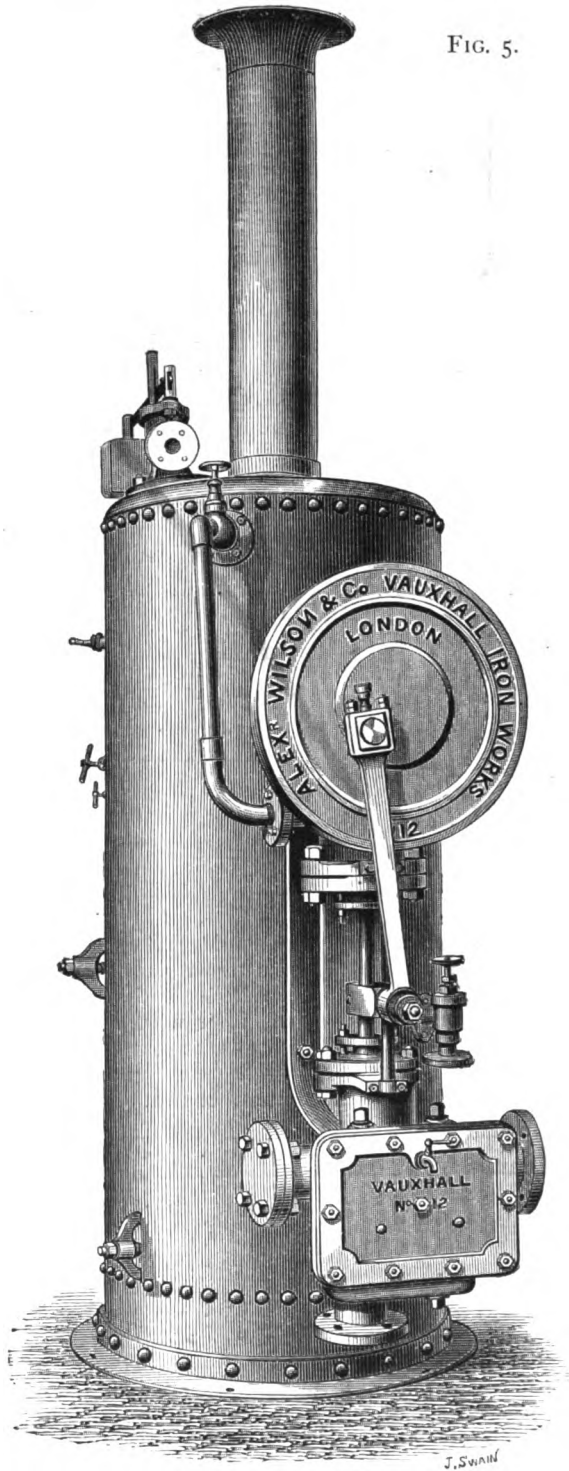
## VAUXHALL DONKEY-PUMPS.

Fig. 4, on opposite page, represents a Steam Pump of a different design; it has two water cylinders, placed to right and left of the steam cylinder; it occupies the smallest possible space for a fly-wheel Pump, the frame at same time forming a large air vessel. The suction and delivery pipes can be arranged either to the right or left. The two water cylinders communicate with the same valves, these valves being easily accessible by means of doors to the right and left. The rods of the water pistons form guides for the rod of the steam piston. This type of Pump can also be used as an ordinary steam engine, the fly wheel being turned to receive a band. It is made in three sizes, of the dimensions given in the table at page 7: Nos. 14, 15, and 16.

Fig. 5 represents one of our No. 12 Vauxhall Donkey-Pumps fixed to a Vertical Boiler, and adapted for use as a small pumping engine for a railway station, similar to the larger one shown at Fig. 6.

For the purpose of feeding the boiler a stop valve is placed on the rising main, by shutting which water can be forced into the boiler through the check valve when the pressure of steam is greater than the head of water in tank. This style of pumping engine is a convenient one whenever a small independent supply of water has to be pumped. We quote for several sizes, but we recommend that the largest size should be used, as the extra expense is very little, and by doing the work in a shorter space of time the cost of attendance is reduced.

No. of Pump .. ..	8	9	10	12
Gallons per hour ..	700	900	1500	1800
Maximum height in feet, pumped with 45 lb. pressure ..	100	100	100	100
Diameter of Boiler ..	2' 3"	2' 3"	2' 6"	2' 6"
Height of Ditto ..	4' 6"	4' 6"	5' 0"	5' 0"
Price of Pump, Boiler, and Valve, without Pipes .. .. .	£50	£53	£60	£68
Extra for Water Pipe, per foot .. .. .	10½d.	1/4½	1/4½	2/0
Extra for Funnel per foot, when exceeding 4 feet .. ..	3/6	3/6	4/0	4/0



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## STEAM PUMP.

FIG. 6.

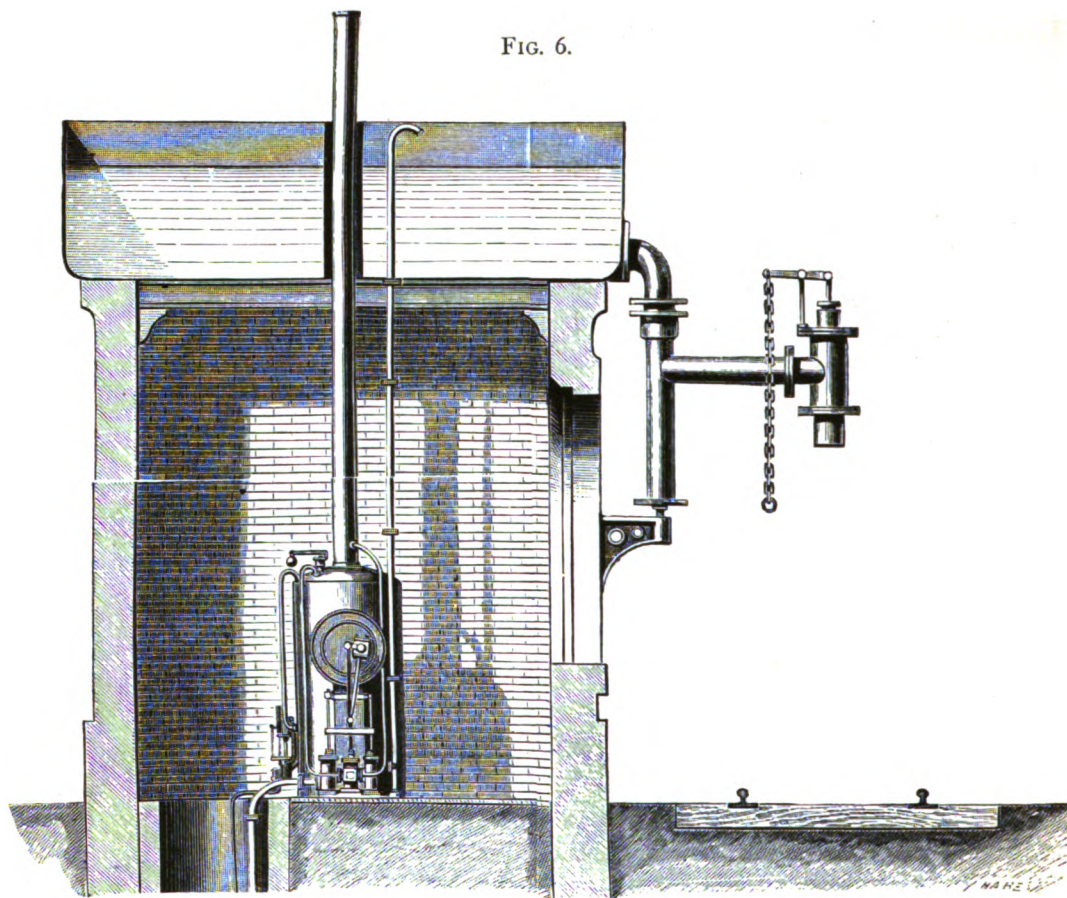


Fig. 6 represents one of our large Steam Pumps, Nos. 14, 15, or 16, fixed to a Vertical Boiler, and adapted for the supply of a water tank at a railway station. These Pumps are represented on a larger scale in Fig. 4. The Boiler is fed by a small Steam-Pump (No. 4 on the List). The water tank may be constructed of either wrought or cast iron; it forms at the same time the roof of the Engine House; the exhaust can be turned into it, thus slightly warming the water and preventing it from freezing in winter. The water crane can either be at a distance, or it can be fastened against the wall of the Engine House as shown.

## PRICE LIST OF COMBINED BOILERS AND PUMPS.

No. of Pump .. . . .	No. 14.	No. 15.	No. 16.	Horse-power of Boiler ..	3	4	6
Diameter of Steam Cylinder .. . . .	5 $\frac{3}{4}$ "	6 $\frac{1}{2}$ "	8"	Price of Pump and Boiler ..			
Diameter of Water Barrels .. . . .	2 $\frac{1}{2}$ "	3"	3 $\frac{3}{4}$ "	without Water Pipes ..	£96	£118	£142
Stroke .. . . .	9	10	12	Extra for Water Pipes, per ..			
Gallons per hour .. . . .	3000	4000	7000	foot .. . . .	3/4	4/2	5/3
Diameter of Boiler .. . . .	2' 6"	2' 9"	3' 3"	Extra for Funnel per foot, ..			
Height of Boiler .. . . .	6' 6"	7' 0"	8' 0"	when exceeding 5 feet ..	4/0	5/0	6/0

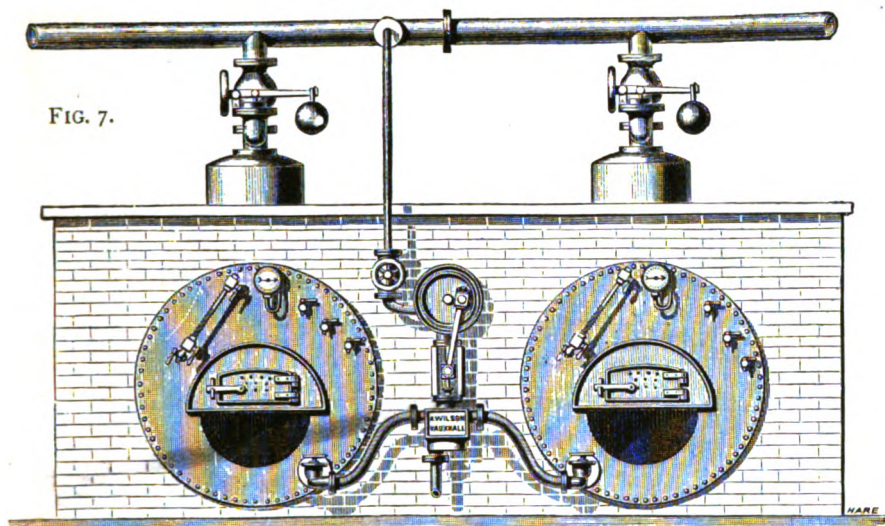
Larger Sizes of Pumps are supplied according to the design shown at Fig. 10. Quotations on application. Estimates given for Tanks and Water Cranes.

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ENGINEERS, VAUXHALL IRON-WORKS, NINE ELMS, LONDON, S.W.



## VAUXHALL DONKEY-PUMPS.

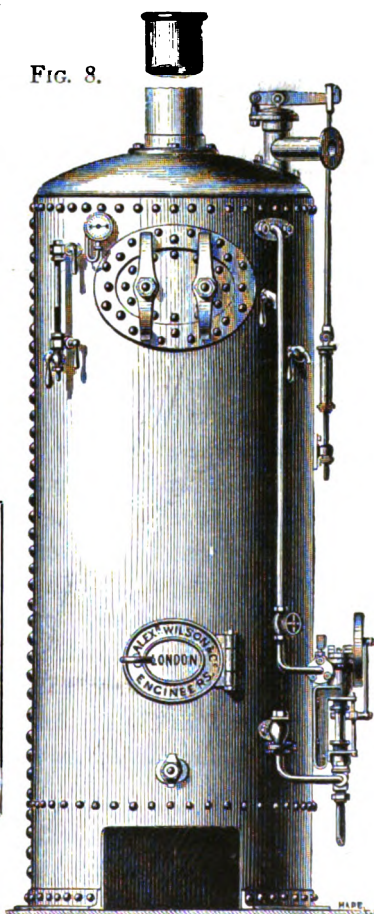
FIG. 7.



Boilers or Pumps in a range can be set down for repairs; others prefer to have one or at most two Pumps for feeding a range of boilers. For Prices of Cornish Boilers see Special List.

Fig. 8 represents a Vertical Boiler, fitted with a small Donkey-Pump for feeding it. In England these Boilers are coming into extensive use, because they are easily fixed; and when provided with a small Pump, they are very useful for distilling fresh water on board steamers and other vessels, as well as supplying steam to the winches on deck. In workshops they are employed for driving steam hammers and other independent machines; and they are extremely useful in all works where they use apparatus for boiling or distilling.

FIG. 8.



## PRICE LIST COMPLETE AS SHOWN.

Horse-Power of Boiler	2	4	6	8	10	12
Diameter of Boiler ..	2' 6"	2' 9"	3' 3"	3' 6"	4' 0"	4' 0"
Height of Boiler, including Ashpit ..	5' 6"	7' 0"	8' 0"	9' 0"	10' 0"	11' 6"
Size of Donkey Pumps	No. 4	No. 4	No. 4	No. 5	No. 5	No. 5
Approxim. Total Weight in Cwts. ... ..	11	21	30	36	45	52
Price, complete .. ..	38 10	55 0	70 0	86 0	102 10	117 10

Quotations given for Sizes not on List.

For Prices of Boilers only, see Special List, page 29.

ALEX. WILSON AND CO.,  
ENGINEERS, VAUXHALL IRON-WORKS, NINE ELMS, LONDON, S.W.

## STEAM PUMPS

### DRIVEN BY ENGINE AND GEARING.

FIG. 9.

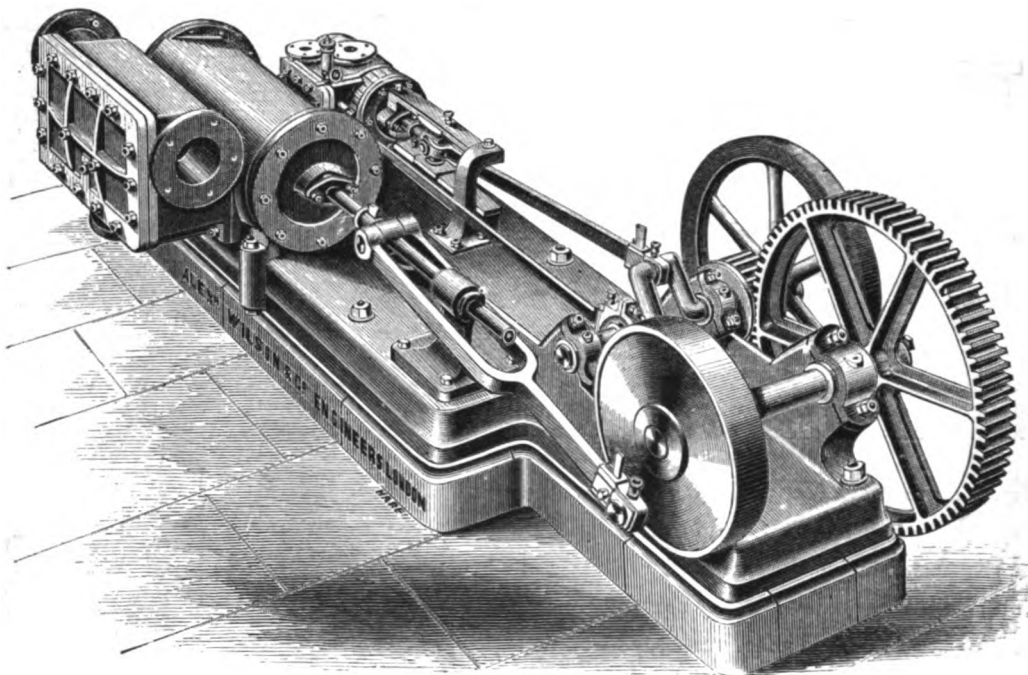


Fig. 9 represents a large Double-acting Pump, 12 inches diameter, 18 inches stroke, driven by a Special Steam Engine, having a steam cylinder 6 inches diameter, 12 inches stroke, the speed of the Pump being reduced from that of the Engine by means of wheel and pinion. By this arrangement the speed of the steam piston is maintained at the proper speed for the most economical use of steam, while the water piston travels at the moderate speed necessary in pumping water. It is complete on one Bed-plate, which is the most convenient arrangement, as it requires no skill to fix it for work, while it is economical in its work as compared with centrifugal pumps when pumping water over 30 feet high, and it is much superior to them in being able to draw from a depth. They are admirably adapted for drainage and irrigation purposes; pumping out cofferdams, and other contractor's work; small water-works and pumping stations for railways; also for many other purposes which will suggest themselves to Engineers requiring such Pumps. The larger sizes are well adapted as Fire Engines, and for raising sunken vessels, when fixed on the deck of a tug. They can also be made portable by fixing them on the top of a Boiler of the Portable Engine type. We make these Pumping Engines of various sizes, as will be seen from the Tabular List on following page. For prices of Boilers to suit these Pumps, see our Boiler Lists for Boilers of corresponding horse-power. Pages 26 to 31.

ALEX. WILSON AND CO.,  
ENGINEERS, VAUXHALL IRON-WORKS, NINE ELMS, LONDON, S.W.

# Price List, Dimensions, &c., of Pumping Engines.

DESCRIPTION ON PRECEDING PAGE.

Horse-Power.	Diameter of Steam Cylinder.	Stroke of Steam Cylinder.	Diam. of Pump.	Stroke of Pump.	Diam. of Water Pipes.	Gallons per Hour at 50 Revolutions.	Height in feet of water forced at 50 lb. steam pressure.	Approximate Weight.	Price.
	Inches.	Inches.	Inches.	Inches.	Inches.			Cwts.	£
2½	5	7½	4	12	3	3,200	180	12	54
3½	6	9	4	12	..	..	270	15	62
4	6½	9	4	12	..	..	310	17	68
2½	5	7½	5	12	3½	5,000	120	14	62
3½	6	9	5	12	..	..	170	17	70
4	6½	9	5	12	..	..	200	19	76
2½	5	7½	6	12	4	6,500	80	20	72
3½	6	9	6	12	..	..	120	23	80
4	6½	9	6	12	..	..	140	25	86
5	7	10	6	12	..	..	160	28	96
2½	5	7½	7	12	5	9,600	60	17	77
3½	6	9	7	12	..	..	90	20	85
4	6½	9	7	12	..	..	100	22	90
5	7	10	7	12	..	..	120	25	100
2½	5	7½	8	18	6	At 35 Revs. 13,000	48	25	92
3½	6	9	8	18	..	..	70	28	100
4	6½	9	8	18	..	..	80	30	106
5	7	10	8	18	..	..	90	33	116
6	8	10	8	18	..	..	120	37	130
3½	6	12	10	18	7	20,000	40	34	125
5	7	12	10	18	..	..	55	40	140
6	8	12	10	18	..	..	75	44	155
8	9	12	10	18	..	..	100	48	166
3½	6	12	12	18	8	25,000	30	46	145
5	7	12	12	18	..	..	40	50	160
6	8	12	12	18	..	..	50	52	175
8	9	12	12	18	..	..	70	56	186

Price of Larger Sizes on application.

ALEX. WILSON AND CO.,  
ENGINEERS, VAUXHALL IRON-WORKS, NINE ELMS, LONDON, S.W.

## STEAM BILGE AND BALLAST PUMPS OF ALL SIZES.

Fig. 10 represents a large Bilge-Pump of novel design, two of the largest sizes of which, having Steam and Water Cylinder 12 inches diameter, 15 inches stroke, have been supplied to the White Star Line of American Steamships. The novel feature is in the arrangement of the connecting rod, which is of an oval form, passing on each side of the Steam Cylinder, and thus economizing space. They are made either vertical or horizontal. Special quotations for Sizes not on List.

No. of Pump .. .. .	20	21	22	23	24	25
Diameter of Steam Cylinder ..	9"	9"	10"	10"	12"	12"
Diameter of Water Barrel ..	6"	9"	8"	10"	9"	12"
Stroke .. .. .	12"	12"	15"	15"	15"	15"
Diameter of Steam Pipe ..	2½"	2½"	2½"	2½"	3"	3"
Diameter of Water Pipe ..	4	6	5	7	6"	8"
Approximate Weight .. cwt.	25	28	33	38	40	45
Price in London .. .. .	£75	£90	£100	£120	£135	£150

FIG. 10.

## PUMPS DRIVEN FROM SHAFTING.

Fig. 11 represents a convenient form of Pump where a line of Shafting is more convenient than a supply of steam. The small sizes of these Pumps are made similar to engraving. Rams and Glands are of Gun Metal. The larger sizes have a wheel and pinion, so as to transmit a greater amount of power. The same sizes of Pumps can be also supplied arranged horizontally. Special quotations for Sizes not on List.

### PRICE OF SMALL PUMP.

Diameter of Ram	1½"	1½"	2"	2½"	2½"	*3"	*3½"
Stroke .. .. .	2"	3"	4"	5"	5"	6"	8"
Diameter of Pulley	6"	10"	14"	16"	18"	20"	24"
Width of Pulley ..	1½"	2"	2½"	3"	3½"	4"	4½"
Strokes per minute	180	150	110	90	90	80	60
Price .. .. .	£5	£8	£11 10	£14	£17	£20	£22

Those marked \* are double acting.

### PRICE OF LARGE PUMP.

Diameter of Water Barrel, double acting .. .. .	3"	3½"	4"	4½"
Stroke .. .. .	6"	8"	8"	8"
Diameter of Pulley .. .. .	14"	16"	18"	20"
Width of Pulley .. .. .	2½"	3"	3½"	4"
Diameter of Pinion .. .. .	3½"	4"	4½"	5"
Diameter of Wheel .. .. .	10"	12"	14"	16"
Strokes per minute .. .. .	80	60	60	60
Price .. .. .	£22	£25	£28	£33

FIG. 11.

ALEX. WILSON AND CO.,

ENGINEERS, VAUXHALL IRON-WORKS, NINE ELMS,  
LONDON, S.W.

# PUMPS FOR BOILER PROVING

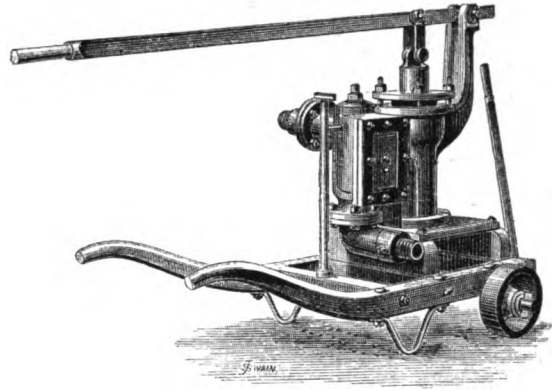
AND EVERY DESCRIPTION OF HYDRAULIC WORK.

Fig. 12 represents a Portable Pump for use in Boiler Proving, and other purposes where a high pressure is required.

We make them in five sizes and for two pressures, and they can be fitted with or without Barrow and Tank as required. Prices include Gauge and connecting Tube.

Diameter of Ram	1"	1½"	2"	3"	4"
Price for 200 lb. pressure .. ..	£6	£9	£14	£16	£18
Price for 600 lb. pressure .. ..	£8	£12	£18	£	£
Extra for Tank..	20/0	30/0	35/0	50/0	60/0
Extra for Barrow	20/0	30/0	30/0	40/0	40/0

FIG. 12.

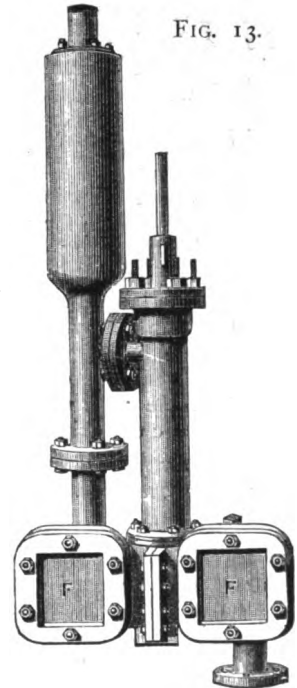


The two largest sizes are made in cast iron, with gun-metal valve and seats.

## DEEP WELL PUMPS

Fig. 13 represents one type of Deep Well Pump, with Single Barrel ; but we manufacture every variety of these Pumps, Single, Double, and Treble Barrels, either in iron or gun metal, having superior facilities for the execution of this class of work. We also supply Slings, Guides, Rods to couple up to any length, Crank Shafts and Frames for hand, steam, wind, or horse power, and every description of accessories connected with Pumps.

FIG. 13.



Diameter of Barrel .. ..	3"	3½"	4"	5"	6"	7"
Stroke of Pump .. ..	9"	12"	12"	12"	15"	15"
Price of Single Barrel, Iron	£ 6 10	£ 7 10	£ 9 0	£ 12 10	£ 17 0	£ 19 10
" " " Brass	8 10	10 10	12 10	17 0	24 0	33 0
Price of Double Barrel, Iron	12 10	14 10	17 10	24 0	33 0	38 10
" " " Brass	16 10	20 10	24 0	33 0	47 10	64 0
Price of Treble Barrel, Iron	18 0	22 0	26 0	35 0	48 0	57 0
" " " Brass	24 0	30 0	35 0	48 0	70 0	95 0

ALEX. WILSON AND CO.,

ENGINEERS, VAUXHALL IRON-WORKS, NINE ELMS, LONDON, S.W.

D

# PATENT "EXCELSIOR" DIRECT-ACTING STEAM PUMP.

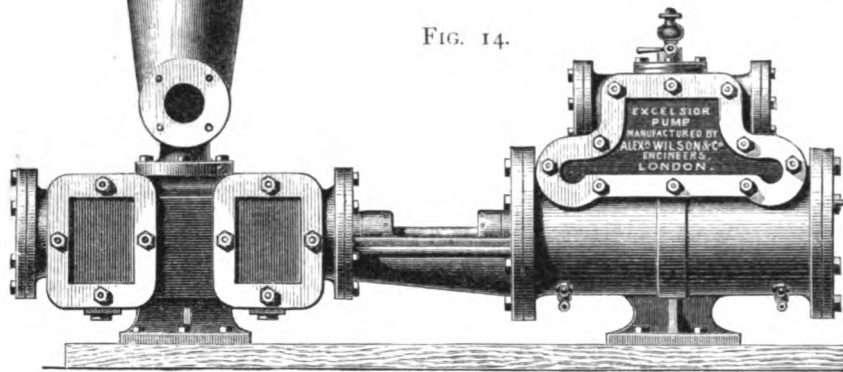
CHEAP AND EFFECTIVE.

DURABLE AND ECONOMICAL.

We beg to call special attention to this Pump, as being the best Direct-Acting Pump of a type which has during the last few years been brought so prominently before the public. We have obtained the sole right of manufacture in Great Britain, after having had one of them in regular work for several months, feeding the Steam Boiler in our own Works at a pressure of 60 lb., besides submitting it to many other severe tests. We

have in our possession numerous testimonials as to its valuable qualities from parties in America, who have been using it for the last four years, the manufacturer there being Mr. Corliss, the well-known inventor of the "Corliss" Engine, and we have every confidence in recommending it to our friends as a reli-

FIG. 14.



able Pump. We are already fixing them in this country, and will publish testimonials of their working shortly; meanwhile we call attention to the guarantee given with each Pump.

Guaranteed to start at any point in its stroke, and works with such accuracy as can only be obtained from a Crank, therefore wastes no steam at ends of Cylinder.

Its working parts are few and simple, and cannot get out of order.

All working parts are covered, and cannot be broken.

Has no outside or complex gear whatever.

Can be arranged to work in any position, vertical or horizontal, and even under water, in an emergency.

Has no dead point in its stroke.

Will discharge the water of condensation.

Is double acting—throwing a continuous stream.

Its working parts can readily be examined by simply removing the cover.

Can be looked after by a labourer.

Can run at any speed, fast or slow, and work at any pressure of steam with a steadiness unsurpassed.

Will work with compressed air, or by vacuum.

Reliable in its working. Wastes no steam, the valves being ordinary slide valves.

Has a clear exhaust, and the valve motion is guaranteed positive under any pressure.

*All Pumps are tested with Steam and Water before leaving the Works, and are of the best Materials and Workmanship.*

N.B.—These Pumps having stood the most severe tests, and merited unqualified approval, we warrant every Pump leaving our Works, and in case it does not fulfil the terms of our guarantee, the money will be refunded.

*This Pump can be applied as a Deep Well Pump, either by placing it down the Well, within 20 feet of the water, and leading steam down to it, or by working it vertically, with the Piston Rod connected to the Plunger with any length of Connecting Rod.*

ALEX. WILSON AND CO.,

ENGINEERS, VAUXHALL IRON-WORKS, NINE ELMS, LONDON, S.W.

# DIMENSIONS AND PRICES OF "EXCELSIOR" STEAM PUMPS.

Diam. of Steam Cylinder ... Inches	*4	4	4	5	*5	5	5	6	*6	6	6	7	*7	7	8	8	*8	8	10	10	12	12	14	14
Diam. of Water Cylinder ..	2½	3	4	2½	3	4	5	3	4	5	6	4	5	6	4	5	6	7	6	7	6	7	8	
Length of Stroke ..	9	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	18	18	18	18	18	
Approximate Gallons Delivered per Hour ..	1380	1950	3400	1380	1950	3400	5300	1950	3400	5300	7900	3400	5300	7900	3400	5300	7900	10500	7900	10500	7900	10500	14130	
Diam. of Steam Pipe .. Inches	¾	¾	1	1	1	1	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	2	2	2½	2½	2½	
Diam. of Exhaust Pipe ..	1	1	1	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	2	2	2	2½	2½	2½	3	3	
Diam. of Water Pipes ..	2	2½	3	2	2½	3	3½	2½	3	3½	4	3	3½	4	3	3½	4	5	4	5	4	5	6	
Nom. Horse-power of Boiler required	1	1	1	1½	1½	1½	2	2	2	2	2	2½	2½	2½	3½	3½	3½	5	5	7	7	10	10	
PRICE IN LONDON .. £	20	22	25	23	24	27	32	28	32	36	40	36	40	44	38	43	48	56	64	70	75	85	95	

• All marked thus are suitable for feeding Boilers, and for all sizes below those quoted we recommend our "VAUXHALL" Donkey-Pumps.

Special attention is called to the LONG STROKES, and the large *area of Water Valves and Pipes* which we adopt.

As these Pumps can be adapted to any use to which steam-driven Pumps can be applied; special Designs and Quotations will be given for any required purpose, with any combination of Steam and Water Cylinder, and any length of Stroke. Brass Liners, Governors, &c., extra.

NOTE.—Intending purchasers will please send the following information with order. Total height of Lift; Depth from which Water has to be drawn; Gallons to be delivered per hour; class of work to be done; pressure of Steam in Boiler, if already erected; how far Pump will be placed from Boiler, and length of Suction Pipe.

Used by the Pacific Mail Steam-Ship Company, the Northern Transportation Company, Alaska Fur Company's Steamers, Stockton Line of Steamers, the Steam Ships 'Empire,' 'C. M. Hutchinson,' 'Coquille,' 'Monteredy,' &c.

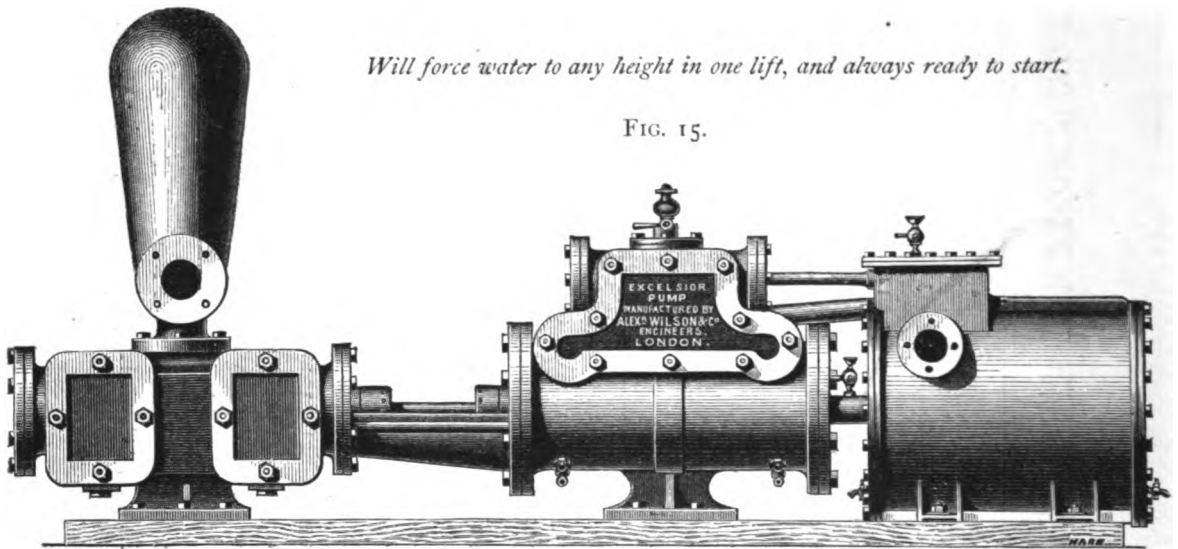


## PATENT "EXCELSIOR" COMPOUND PUMPING ENGINES.

As public attention is now strongly directed towards the vital question of reducing the consumption of fuel for generating steam, and the economical use of same, we feel assured, in drawing attention to the Patent Excelsior Compound Pump, that we supply a want long felt, viz. an economical, reliable, and durable Pumping Engine, at a moderate prime cost. Direct-Acting Steam Pumps, not working steam expansively, but for the full length of their stroke, are not economical for Pumps of a large capacity, and necessarily waste power, which, if worked expansively in a second or low-pressure cylinder, would develop an effective additional pressure, equal to from 30 to 50 %, according to the ratio of expansion. In compounding our High-Pressure Cylinder, we claim to accomplish this great saving at a comparatively trifling expense, both of money and space, the Low-Pressure Cylinder being of the simplest and most compact design. *And we would impress the fact* that this additional cost is in a great measure compensated for by the SAVING of COST in the BOILER; the Compound Engine requiring less steam than the simple High-Pressure Engine for the performance of the same duty, and a proportionately smaller boiler is required. We therefore recommend the compounding of all Pumps above 7" for all general purposes, as the total length of the Excelsior Compound Steam-Pump is very little more than that of Direct-Acting Steam Pumps of the piston-valve class, and the saving in working expenses will pay for the entire Pump in a very short time.

*Will force water to any height in one lift, and always ready to start.*

FIG. 15.



Works Steam expansively. Wastes no Steam in any of its functions. Compact and Durable. Has plain Slide Valves, easily got at. Has no Dead Point in its Stroke.

Special Pump Valves and Seats for heavy pressures. All Pump Valves independent of each other. Both Pistons can be removed without disturbing the Engine.

**ALEX. WILSON AND CO.,**  
ENGINEERS, VAUXHALL IRON-WORKS, NINE ELMS, LONDON, S.W.



## LIST OF SIZES FOR COMPOUND ENGINES.

Diam. High-Pressure Cylinder	In.	8	8	8	10	10	12	12	12	14	14	14	16	16	18	18	20	20	25	25
" Low-Pressure Cylinder	"	16	16	16	20	20	24	24	24	28	28	28	32	32	36	36	40	40	50	50
" Water Cylinder	"	5	6	7	5	6	7	8	8	9	8	9	8	9	10	10	12	14	14	14
Length of Stroke	"	12	12	12	18	18	24	24	24	24	24	24	24	24	36	36	42	42	42	42
Delivered per Hour, Approximate capacity in Gals.	"	5300	7900	10500	5300	7900	10500	10500	14130	10500	14130	17900	14130	17900	22200	32900	43000	32900	43000	43000
Diam. Steam Pipe	In.	1½	1½	1½	2	2	2½	2½	2½	2½	2½	2½	2½	2½	3	3	3½	3½	4	4
" Exhaust Pipe	"	3	3	3	4	4	4½	4½	4½	5	5	5	5½	5½	6	6	7	7	8	8
" Water Pipes	"	3½	4	5	3½	4	5	4	5	6	5	6	7	6	8	9	10	9	10	10
Nominal H. P. of Boiler required when working at 60 lb. Steam Pressure	"	5	5	5	8	8	12	12	12	16	16	16	20	20	25	25	30	30	50	50
Price in London	£																			

## LIST CONTINUED, FOR HIGH LIFTS.

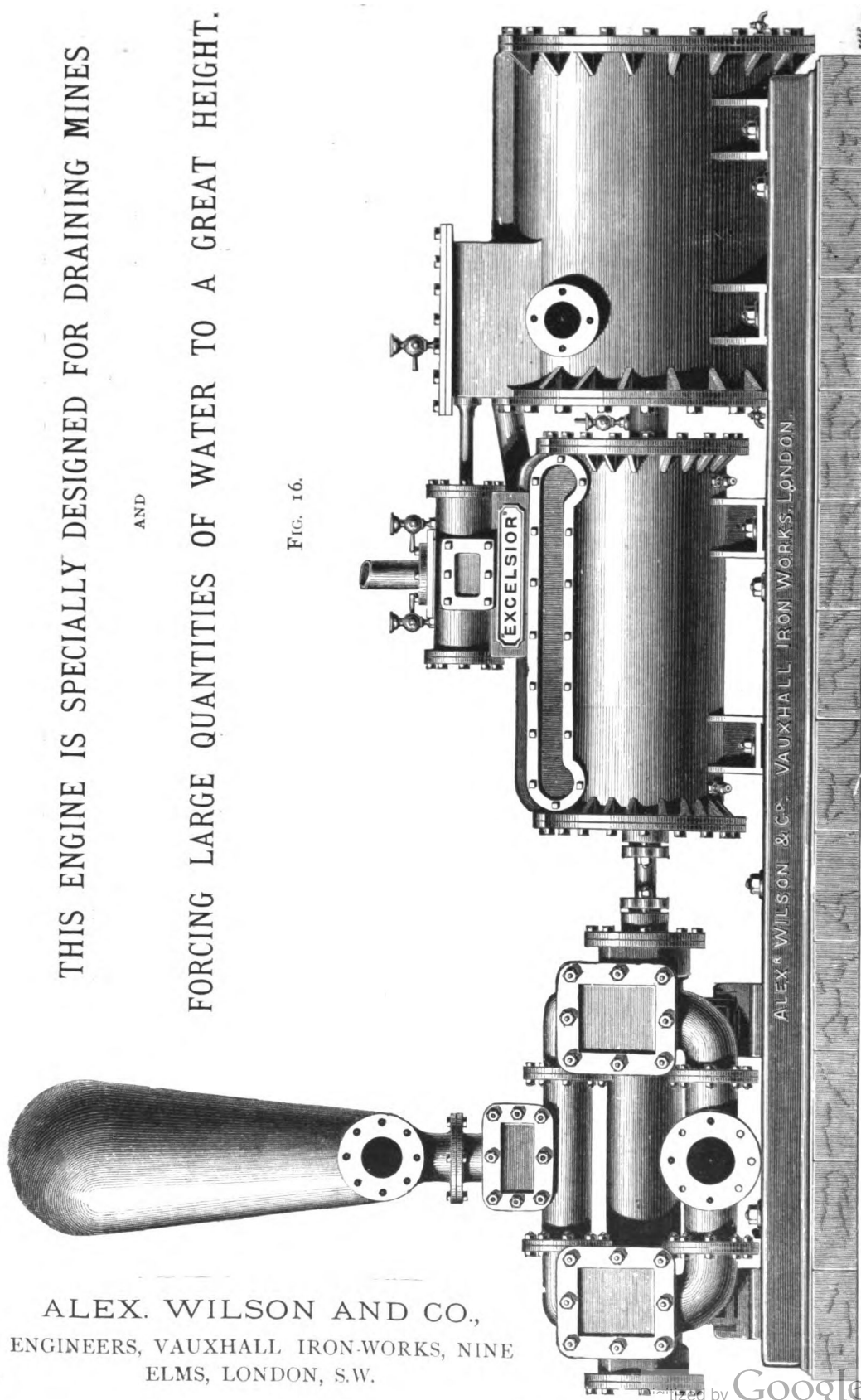
Diam. of High-Pressure Cylinder	Inches	8	8	10	10	12	12	14	14	16	16	16	18	18	20	20	20	25	25	25
" Low-Pressure Cylinder	"	16	16	20	20	24	24	28	28	32	32	32	36	36	40	40	40	50	50	50
" Water Cylinder	"	3	4	3	4	4	5	5	6	5	6	7	8	9	8	9	10	8	9	10
Length of Stroke	"	12	12	18	18	24	24	24	24	24	24	24	36	36	42	42	42	42	42	42
Approximate Gallons delivered per Hour	"	1950	3400	1950	3400	3400	5300	5300	7900	5300	7900	10500	10500	14120	17900	17900	22200	14130	17900	22000
Diameter of Steam Pipe	Inches	1½	1½	2	2	2½	2½	2½	2½	2½	2½	2½	2½	3	3	3½	3½	4	4	4
" Exhaust Pipe	"	3	3	4	4	4½	4½	5	5	5½	5½	5½	6	6	7	7	7	8	8	8
" Water Pipes	"	2½	3	2½	3	3	3½	3½	4	3½	4	5	5	6	7	6	7	6	7	8
Nominal H. P. of Boiler required when working at 60 lb. Steam Pressure	"	5	5	8	8	12	12	16	16	20	20	20	25	25	30	30	30	50	50	50
Price in London	£																			

ALEX. WILSON AND CO.,

ENGINEERS, VAUXHALL IRON-WORKS, NINE ELMS, LONDON, S.W.

THIS ENGINE IS SPECIALLY DESIGNED FOR DRAINING MINES  
AND  
FORCING LARGE QUANTITIES OF WATER TO A GREAT HEIGHT.

FIG. 16.



ALEX. WILSON AND CO.,  
ENGINEERS, VAUXHALL IRON-WORKS, NINE  
ELMS, LONDON, S.W.

## THE PATENT "EXCELSIOR" COMPOUND PUMPING ENGINE,

Shown on the opposite page, is specially designed for draining mines and for use as a Water-Works Engine for High Duty and Heavy Lifts, doing away with all the expensive drawbacks to the Cornish Engine, viz. : Prime cost, massive foundations, heavy connecting rods and plungers, and expensive Boiler houses, and yet indicating a duty that will compare favourably with it. Can be placed at the bottom of a mine, and leaves a clear shaft.

In case of a new shaft being sunk, the Pump can be lowered and worked at an increased steam pressure. When placed in a new mine, care should be taken to allow for working at a low pressure, so that the Pump may be lowered to each successive level as work is completed, and so increase duty ; being compact on one bed plate, and requiring no foundation, this can be accomplished involving little expense and labour.

The Low-Pressure Engines are Steam-jacketed, and a Retaining Valve placed in all Pumps for High Lifts.

Used by the Phoenix, Excelsior, Carroforths, Gover, and a hundred other Mines, Collieries, &c.

## THE PATENT "EXCELSIOR" DIRECT-ACTING STEAM PUMPS

Are extensively in use in Mines, Water Works, Railways, Steam Ships, Irrigation Works, Feeding Boilers, Raising Sunken Vessels, Working Accumulators for Hydraulic Machinery, Cranes, Riveters, &c., and in Manufactories of every description.

We wish to draw the special attention of Steam-Ship Owners to its practical and proved utility as a Circulating Pump for Surface Condensers, also as an independent Feed Pump for the Boilers. We also call the attention of the following Manufacturers, &c., this Pump being designed, in its various modifications, to suit the wants of each.

BLEACHERS,  
WRECKERS,  
PLANTERS,  
CHEMICAL MANUFACTURERS,

SUGAR REFINERS,  
CONTRACTORS,  
TANNERS,  
SOAP MANUFACTURERS,

BREWERS,  
OIL REFINERS.  
QUARRY PUMPS,  
LOCOMOTIVE PUMPS.

*This Pump can be applied as a Deep Well Pump, either by placing it down the Well, within 20 feet of the water, and leading steam down to it, or by working it vertically, with the Piston Rod connected to the Plunger with any length of Connecting Rod.*

Used by the Central Pacific Railroad Company, Southern Pacific Railway, Northern Pacific Railway.

Used and recommended by the Risdon Iron and Locomotive Works ; Fulton Foundry ; Hinckley and Co. ; Deacon and Bulger ; Portland Boiler Company ; James Craig, Esq., M.I.C.E. ; Charles Elliot, Superintendent, Spring Valley Water-Works, &c.

ALEX. WILSON AND CO.,  
ENGINEERS, VAUXHALL IRON-WORKS, NINE ELMS, LONDON, S.W.

## VERTICAL ENGINES.

We manufacture every description of Combined Vertical Engine and Boiler—Single and Double Cylinder—with and without Reversing Gear. Fig. 17 represents a Double-Cylinder Engine, 5 inches diameter,  $7\frac{1}{2}$  inch stroke, fitted with Reversing Gear, which was constructed for Messrs. Siemens Bros., Charlton, for Telegraph Cable winding purposes. Similar Engines have been supplied for the same purpose to the Indiarubber, Guttapercha, and Telegraph Works Company, Silvertown. Quotations given for Special Engines not in Lists.

FIG. 17.

## PRICE LIST OF COMBINED VERTICAL BOILER AND ENGINE.

## SINGLE CYLINDERS.

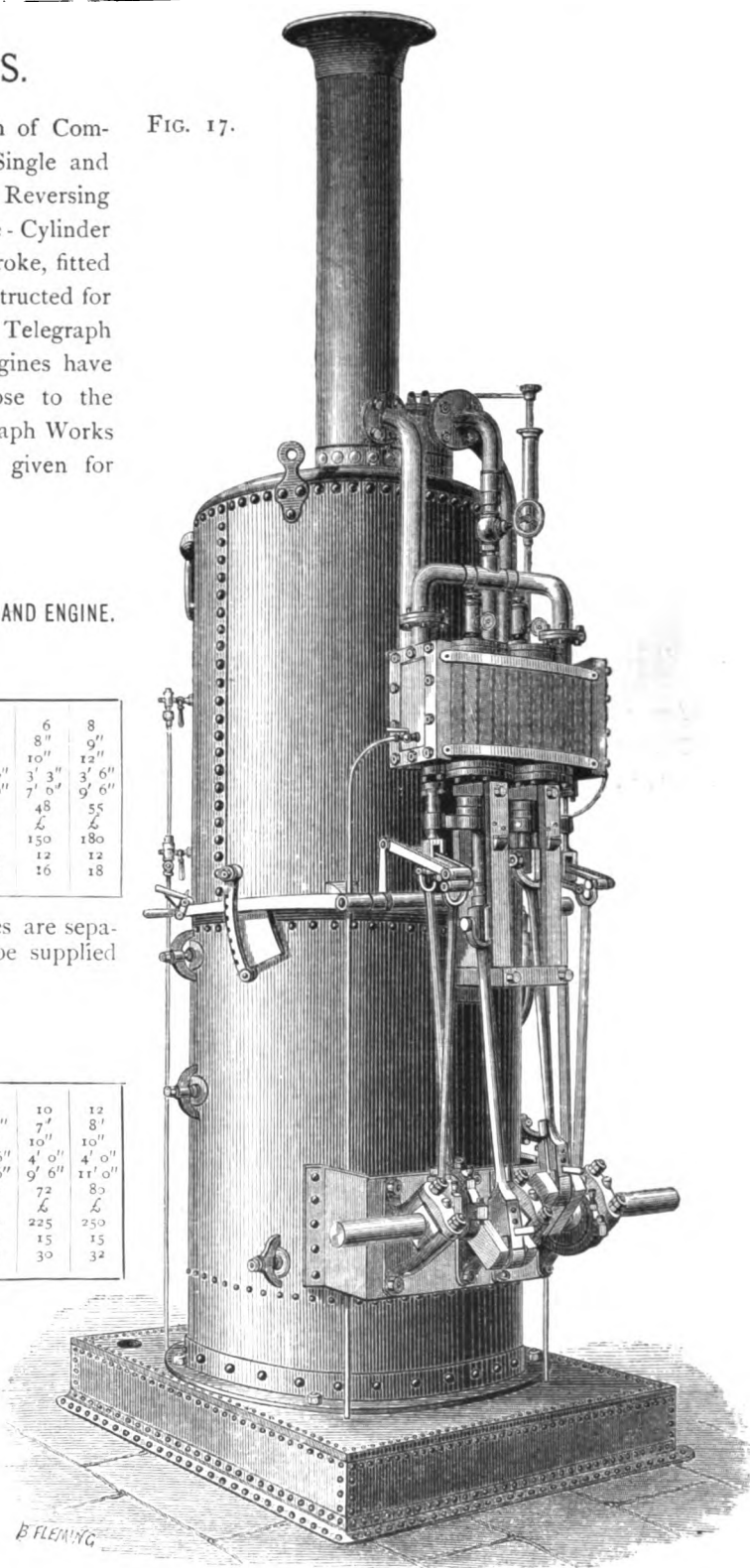
Nominal Horse-power	2½	3	4	5	6	8
Diameter of Cylinders	5"½	5½"	6½"	7"	8"	9"
Stroke .. .. .	7½"	7½"	9"	10"	10"	12"
Diameter of Boiler ..	2' 6"	2' 6"	2' 9"	3' 0"	3' 3"	3' 6"
Height of Boiler ..	5' 6"	6' 0"	6' 6"	7' 0"	7' 6"	9' 6"
Approx. Weight cwts.	22	26	34	40	48	55
Price, including Feed Pump .. .. .	75	85	105	125	150	180
Extra for Governor ..	8	8	10	10	12	12
Extra for Reversing Gear	12	12	14	15	16	18

The Frames of the above Engines are separate from Boiler, but they can also be supplied similar to woodcut.

## DOUBLE CYLINDERS.

Nominal Horse-power	5	6	7	8	10	12
Diameter of Cylinder	5"½	5½"	6"	6½"	7"	8"
Stroke .. .. .	7½"	7½"	9"	9"	10"	10"
Diameter of Boiler ..	3' 0"	3' 3"	3' 3"	3' 6"	4' 0"	4' 0"
Height of Boiler ..	7' 0"	7' 6"	8' 6"	9' 6"	9' 6"	11' 0"
Approx. total weight cwts.	40	48	55	62	72	80
Price, including Feed Pump .. .. .	130	155	175	190	225	250
Extra for Governor ..	10	12	12	12	15	15
Extra for Reversing Gear	24	24	26	28	30	32

The Frames of the above Engines are separate from the Boilers, but they can also be supplied similar to woodcut, where lightness is a consideration.

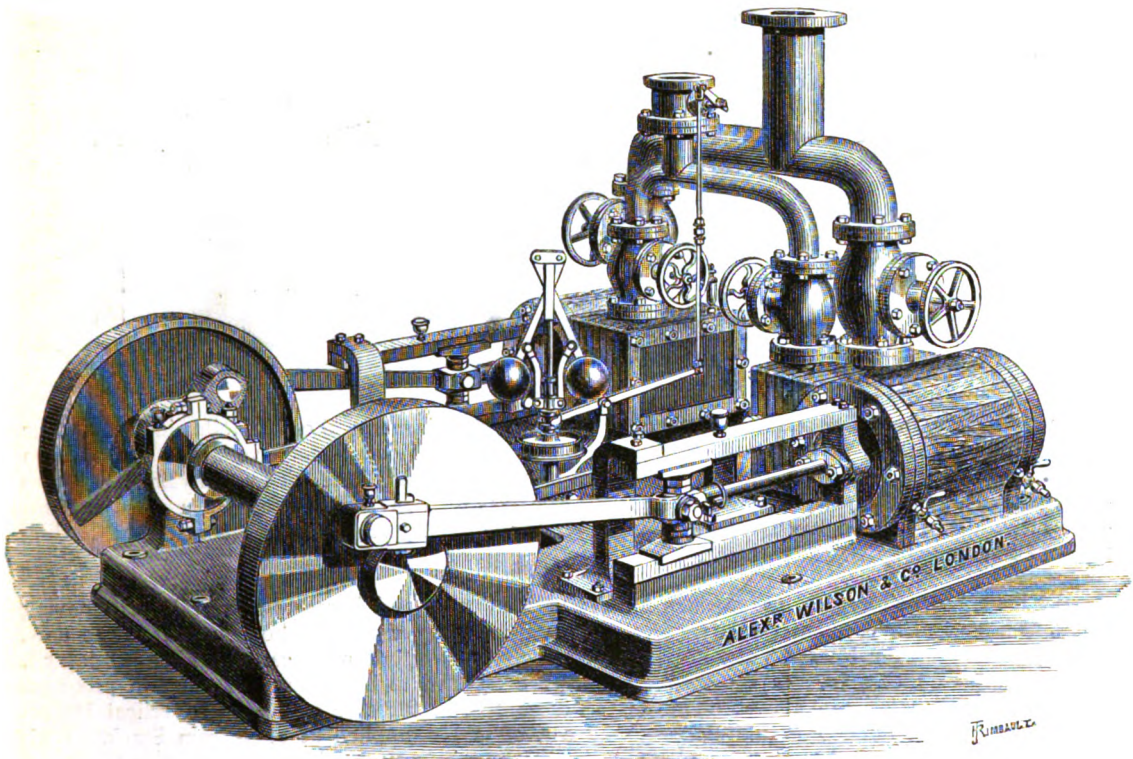


**ALEX. WILSON AND CO.,**  
ENGINEERS, VAUXHALL IRON-WORKS, NINE ELMS, LONDON, S.W.

# HORIZONTAL ENGINES

## OF SPECIAL DESIGN.

FIG. 18.



We manufacture every description of Horizontal Engine—Single or Double Cylinder—with and without Reversing Gear. Fig. 18 represents a Double-Cylinder Engine, designed for a special purpose, several sizes of which we have constructed for one of the most eminent Engineering Firms in this country. Prices given below are for Engines of ordinary type. Quotations given for Special Engines not specified in following Table.

### PRICE LIST OF HORIZONTAL STEAM-ENGINES.

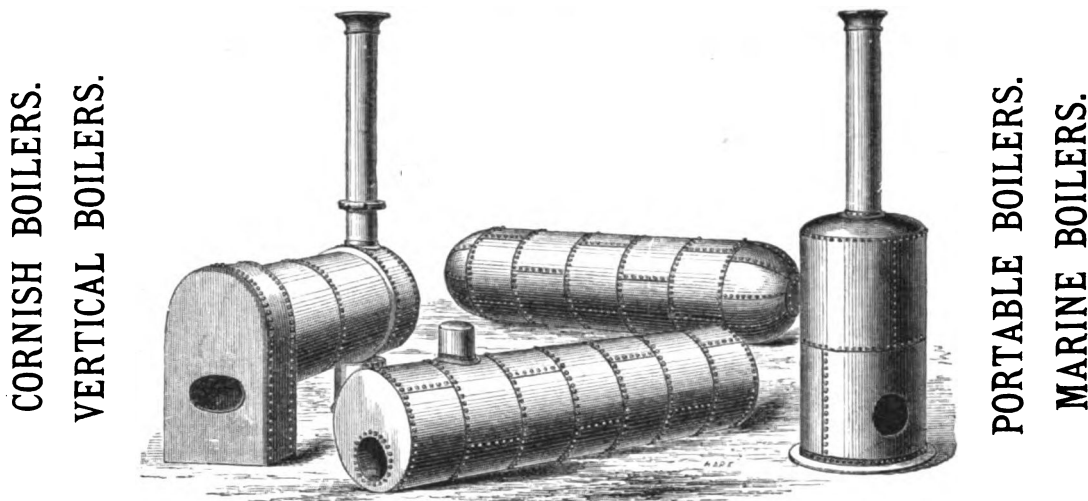
Nominal Horse-power .. .. .	2½	3½	4	5	6	8	10	12	14	16
Diameter of Cylinder .. .. Inches	5	6	6½	7	8	9	10	11	12	14
Length of Stroke .. .. .	7½	9	9	10	10	12	14	16	16	18
Price of Engine .. .. .	£28	£36	£42	£52	£66	£84	£105	£120	£130	£160
Extra if fitted with Governor .. ..	8	8	10	10	12	12	14	14	15	15
Extra if fitted with Feed Pump .. ..	4	5	5	6	7	7	8	9	9	12
Extra if fitted with Expansion Valves ..	6	6	6	6	8	9	10	12	15	15
Extra if fitted with Reversing Gear ..	12	13	14	15	16	18	20	22	24	27

For Coupled Engines of the above sizes, and double the power, the Prices are to be taken as twice those given in the above Table.

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FIG. 19.



In compiling the Tabular Price Lists of Boilers, which follow on the five following pages, we believe we are justified in saying that such complete Boiler Price Lists have never before been compiled by any other Firm in the trade, and that it supplies a want long felt by many Engineers who do not manufacture their own Boilers, as by filing our Lists for convenient reference a great amount of correspondence will be saved, the dimensions, quality of plates, weights, and prices of the leading types of Boilers being seen at a glance.

We have adopted certain proportions for the various types and horse-powers of Boilers, having taken, as a general rule, about 10 square feet of heating surface per nominal horse-power, as the unit, except in regard to the Return Tube Boilers, where a greater proportion of heating surface is adopted. Having adopted these sizes as standard ones, we are enabled to keep many of them in progress, so that quick dispatch can always be given to orders, and in the case of the small vertical Boilers and Six and Eight horse Portable Boilers, they can often be supplied at once from Stock. With uniform dimensions, and the repetition of these dimensions, we have also been enabled to reduce the cost, and at the same time improve the quality of the workmanship, by having a complete set of templates and mould blocks for all the flanged plates of the various sizes, which gives greater precision to the operations of the workmen, and leaves nothing to the old system of rule of thumb. The quality of plates used, where "Lowmoor, or equal quality," is not specified, is invariably Staffordshire, as the plates made in that district are more reliable for Boiler-making purposes than those made from the cheaper irons of other districts, though the latter may apparently have an equal tensile strength.

The use of angle iron is avoided wherever possible, and the plates flanged instead, as that is of itself a good test of the quality of the plate.

Every Boiler is tested by hydraulic pressure to about double the working pressure, and the smaller ones with steam to about 50 per cent. above the working pressure, so that they can always be depended on as being perfectly tight before leaving the Works.

Delivery is made free in London, Liverpool, Hull, or any intermediate Railway Station, and the Prices are net, and subject to alteration according to the Price of iron. The Prices are calculated on the basis of Staffordshire marked bars, at £11 per ton, and for guidance they would fluctuate about 2½ per cent. for every 20s. rise or fall.

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## CORNISH BOILERS.

Nominal Horse-power	2	4	6	8	10	12	14	16	18	20	25	30
Diameter	2 ft. 9 in.	3 ft. 9 in.	4 ft. 3 in.	4 ft. 4 in.	4 ft. 6 in.	4 ft. 8 in.	4 ft. 9 in.	4 ft. 9 in.	5 ft. 0 in.	5 ft. 6 in.	5 ft. 6 in.	6 ft. 0 in.
Length	6 ft. 0 in.	7 ft. 6 in.	10 ft. 0 in.	13 ft. 0 in.	14 ft. 0 in.	15 ft. 0 in.	16 ft. 0 in.	17 ft. 6 in.	18 ft. 0 in.	19 ft. 0 in.	25 ft. 0 in.	26 ft. 0 in.
Diameter of Flue	1 ft. 3 in.	2 ft. 0 in.	2 ft. 2 in.	2 ft. 2 in.	2 ft. 2 in.	2 ft. 4 in.	2 ft. 4 in.	2 ft. 6 in.	2 ft. 9 in.	1 ft. 9 in.	1 ft. 9 in.	2 ft. 0 in.
Diameter of Dome	1 ft. 0 in.	1 ft. 3 in.	1 ft. 6 in.	1 ft. 6 in.	1 ft. 9 in.	1 ft. 9 in.	1 ft. 9 in.	1 ft. 9 in.	2 ft. 0 in.	2 ft. 3 in.	2 ft. 3 in.	2 ft. 6 in.
Height of Dome	1 ft. 0 in.	1 ft. 6 in.	1 ft. 9 in.	1 ft. 9 in.	2 ft. 0 in.	2 ft. 0 in.	2 ft. 0 in.	2 ft. 6 in.	2 ft. 6 in.	2 ft. 6 in.	2 ft. 6 in.	3 ft. 0 in.
Thickness and Quality of Shell	$\frac{1}{16}$ in. B	$\frac{3}{16}$ in. B	$\frac{3}{16}$ in. B	$\frac{3}{16}$ in. B	$\frac{3}{16}$ in. B	$\frac{3}{16}$ in. B	$\frac{3}{16}$ in. B	$\frac{3}{16}$ in. B	$\frac{3}{16}$ in. B	$\frac{7}{16}$ in. B	$\frac{7}{16}$ in. B	$\frac{1}{8}$ in. B
Ditto ditto Flue	$\frac{1}{4}$ in. BB	$\frac{3}{16}$ in. BB	$\frac{3}{16}$ in. BB	$\frac{3}{16}$ in. BB	$\frac{3}{16}$ in. BB	$\frac{3}{16}$ in. BB	$\frac{3}{16}$ in. BB	$\frac{3}{16}$ in. BB	$\frac{3}{16}$ in. BB	$\frac{7}{16}$ in. BB	$\frac{7}{16}$ in. BB	$\frac{1}{8}$ in. BB
Ditto ditto Ends	$\frac{3}{16}$ in. BB	$\frac{1}{2}$ in. BB	$\frac{1}{2}$ in. BB	$\frac{1}{2}$ in. BB	$\frac{1}{2}$ in. BB	$\frac{1}{2}$ in. BB	$\frac{1}{2}$ in. BB	$\frac{1}{2}$ in. BB	$\frac{1}{2}$ in. BB	$\frac{3}{8}$ in. BB	$\frac{3}{8}$ in. BB	$\frac{1}{2}$ in. BB
Ditto ditto Dome	$\frac{1}{16}$ in. BB	$\frac{3}{16}$ in. BB	$\frac{3}{16}$ in. BB	$\frac{3}{16}$ in. BB	$\frac{3}{16}$ in. BB	$\frac{3}{16}$ in. BB	$\frac{3}{16}$ in. BB	$\frac{3}{16}$ in. BB	$\frac{3}{16}$ in. BB	$\frac{3}{16}$ in. BB	$\frac{3}{16}$ in. BB	$\frac{1}{8}$ in. BB
Approximate Weight of Boiler in cwts.	16	25	36	45	50	62	66	70	90	115	140	180
Price of Boiler, as specified above	£ 22	£ 47	£ 68	£ 78	£ 85	£ 100	£ 110	£ 122	£ 137	£ 180	£ 220	£ 285
Extra for Furnace Fittings	£ 3 10	£ 4 10	£ 5 0	£ 5 0	£ 5 5	£ 5 10	£ 5 15	£ 6 0	£ 7 0	£ 9 0	£ 9 0	£ 10 0
Ditto Galloway Tubes, each	2 0	2 15	3 0	3 0	3 0	3 10	3 10	3 15	4 0	2 15	2 15	2 15
Ditto Mountings	6 10 lb.	7 10 lb.	8 0 lb.	8 0 lb.	10 0 lb.	12 0 lb.	14 0 lb.	16 0 lb.	18 0 lb.	20 0 lb.	25 0 lb.	30 0 lb.
Hydraulic Test, per square inch	150	150	130	130	120	120	120	120	120	120	120	120

In every case Low Moor, or equal quality, Plates are put over the fire in the Flues. All the End Plates are flanged into Shell. All Shells over 5 feet diameter are double riveted on longitudinal seams. The last three sizes have two Flues each.

Mountings include Safety Valve, Stop Valve, Check Valve, Pressure Gauge, Water Gauge, Gauge Cocks, and Blow-off Cock. Furnace Fittings include Furnace Front, Dead Plate, Fire Bars, and Bridge.

In the above and following Tables, "B" indicates "Staffordshire Best," and "BB" "Staffordshire Best Best" Plates. "LM" indicates "Low Moor," "Bowling," or "Farley" Plates.

ALEX. WILSON AND CO.,

ENGINEERS, VAUXHALL IRON-WORKS, NINE ELMS, LONDON, S.W.



## VERTICAL TUBULAR BOILERS.

Nominal Horse-power	2	3	4	5	6	7	8	9	10	11	12
Diameter of Shell	2 ft. 6 in.	2 ft. 6 in.	2 ft. 9 in.	3 ft. 0 in.	3 ft. 3 in.	3 ft. 3 in.	3 ft. 3 in.	3 ft. 6 in.	4 ft. 0 in.	4 ft. 0 in.	4 ft. 0 in.
Height of ditto	5 ft. 0 in.	6 ft. 0 in.	6 ft. 6 in.	7 ft. 0 in.	7 ft. 6 in.	8 ft. 6 in.	8 ft. 6 in.	9 ft. 0 in.	9 ft. 6 in.	10 ft. 0 in.	11 ft. 0 in.
Diameter of Fire Box	2 ft. 0 in.	2 ft. 0 in.	2 ft. 3 in.	2 ft. 6 in.	2 ft. 8 in.	2 ft. 8 in.	2 ft. 11 in.	3 ft. 2 in.	3 ft. 5 in.	3 ft. 5 in.	3 ft. 5 in.
Height of ditto	2 ft. 6 in.	3 ft. 0 in.	3 ft. 0 in.	3 ft. 6 in.	3 ft. 6 in.	3 ft. 6 in.	3 ft. 6 in.	4 ft. 0 in.	4 ft. 0 in.	4 ft. 0 in.	4 ft. 0 in.
Number of Tubes	12	14	16	18	20	22	25	27	30	27	30
Diameter of ditto	2 ft. 1 in.	2 ft. 1 in.	2 ft. 1 in.	2 ft. 1 in.	2 ft. 1 in.	2 ft. 1 in.	2 ft. 1 in.	2 ft. 1 in.	2 ft. 1 in.	2 ft. 1 in.	2 ft. 1 in.
Thickness and quality of Shell	in. $\frac{1}{8}$ B	in. $\frac{1}{8}$ B	in. $\frac{3}{8}$ B	in. $\frac{3}{8}$ B	in. $\frac{3}{8}$ B	in. $\frac{3}{8}$ B	in. $\frac{3}{8}$ B	in. $\frac{3}{8}$ B	in. $\frac{3}{8}$ B	in. $\frac{3}{8}$ B	in. $\frac{3}{8}$ B
Ditto ditto Crown	in. $\frac{1}{8}$ BB	in. $\frac{1}{8}$ BB	in. $\frac{1}{8}$ BB	in. $\frac{1}{8}$ BB	in. $\frac{1}{8}$ BB	in. $\frac{1}{8}$ BB	in. $\frac{1}{8}$ BB	in. $\frac{1}{8}$ BB	in. $\frac{1}{8}$ BB	in. $\frac{1}{8}$ BB	in. $\frac{1}{8}$ BB
Ditto ditto Fire Box	in. $\frac{3}{8}$ BB	in. $\frac{3}{8}$ BB	in. $\frac{3}{8}$ BB	in. $\frac{3}{8}$ BB	in. $\frac{3}{8}$ BB	in. $\frac{3}{8}$ BB	in. $\frac{3}{8}$ BB	in. $\frac{3}{8}$ BB	in. $\frac{3}{8}$ BB	in. $\frac{3}{8}$ BB	in. $\frac{3}{8}$ BB
Ditto ditto Tube Plate	in. $\frac{1}{8}$ BB	in. $\frac{1}{8}$ BB	in. $\frac{1}{8}$ BB	in. $\frac{1}{8}$ BB	in. $\frac{1}{8}$ BB	in. $\frac{1}{8}$ BB	in. $\frac{1}{8}$ BB	in. $\frac{1}{8}$ BB	in. $\frac{1}{8}$ BB	in. $\frac{1}{8}$ BB	in. $\frac{1}{8}$ BB
Approximate weight of Boiler in cwt.	9	12	17	20	24	27	30	34	37	40	44
Price of Boiler, as specified above	£ 17 0	£ 21 0	£ 26 0	£ 32 0	£ 38 0	£ 44 0	£ 51 0	£ 55 0	£ 58 0	£ 63 0	£ 70 0
Extra for Fire Box of Lowmoor	3	3	4	4	5	5	5	6	6	7	7
Ditto Ashpit	2	2	2	2	3	3	3	3	4	4	4
Ditto Fire Bars	1	1	1	1	1	1	2	2	2	2	2
Ditto Base Plate	1	1	2	2	2	2	3	3	3	3	3
Ditto Smoke Box and Funnel	2	2	3	3	4	4	4	5	6	6	6
Ditto Mountings	6	6	7	7	8	8	8	9	10	11	12
Hydraulic Test, per square inch	150	150	150	140	140	140	140	140	130	130	130

Mountings include Safety Valve, Stop Valve, Check Valve, Pressure Gauge, Water Gauge, Gauge Cocks, and Blow-off Cock.

Fire Door is included in price of Boiler.

"B" indicates "Staffordshire Best," and "BB" "Staffordshire Best Best" Plates.

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## VERTICAL CROSS TUBE BOILERS.

Nominal Horse-power	2	3	4	5	6	7	8	9	10	11	12
Diameter of Shell	2 ft. 6 in.	2 ft. 6 in.	2 ft. 9 in.	3 ft. 0 in.	3 ft. 3 in.	3 ft. 3 in.	3 ft. 6 in.	3 ft. 9 in.	4 ft. 0 in.	4 ft. 4 in.	4 ft. 0 in.
Height of ditto	5 ft. 0 in.	6 ft. 0 in.	6 ft. 6 in.	7 ft. 0 in.	7 ft. 6 in.	8 ft. 6 in.	8 ft. 6 in.	9 ft. 0 in.	9 ft. 6 in.	10 ft. 0 in.	11 ft. 0 in.
Diameter of Fire Box	2 ft. 0 in.	2 ft. 0 in.	2 ft. 3 in.	2 ft. 6 in.	2 ft. 8 in.	2 ft. 8 in.	2 ft. 11 in.	3 ft. 2 in.	3 ft. 5 in.	3 ft. 5 in.	3 ft. 5 in.
Height of ditto	3 ft. 6 in.	3 ft. 9 in.	4 ft. 0 in.	4 ft. 6 in.	4 ft. 9 in.	5 ft. 0 in.	5 ft. 6 in.	6 ft. 0 in.	6 ft. 3 in.	6 ft. 6 in.	7 ft. 0 in.
Number of Cross Tubes	1 No.	2 No.	2 No.	2 No.	3 No.	3 No.	4 No.	4 No.	5 No.	5 No.	6 No.
Diameter of ditto	1 ft. 0 in.	1 ft. 0 in.	1 ft. 0 in.	1 ft. 0 in.	1 ft. 0 in.	1 ft. 0 in.	1 ft. 0 in.	1 ft. 0 in.	1 ft. 0 in.	1 ft. 0 in.	1 ft. 0 in.
Diameter of Up-take	0 ft. 7 in.	0 ft. 7 in.	0 ft. 7 in.	0 ft. 8 in.	0 ft. 8 in.	0 ft. 8 in.	0 ft. 8 in.	0 ft. 8 in.	0 ft. 8 in.	0 ft. 8 in.	0 ft. 8 in.
Diameter of Chimney	4 ft. 0 in.	4 ft. 0 in.	4 ft. 0 in.	4 ft. 6 in.	5 ft. 0 in.	5 ft. 0 in.	5 ft. 6 in.	5 ft. 6 in.	6 ft. 0 in.	6 ft. 0 in.	7 ft. 0 in.
Thickness and Quality of Shell	1 1/8 in. B	1 1/8 in. B	1 1/8 in. B	1 1/8 in. B	1 1/8 in. B	1 1/8 in. B	1 1/8 in. B	1 1/8 in. B	1 1/8 in. B	1 1/8 in. B	1 1/8 in. B
Ditto ditto Fire Box	3/8 in. BB	3/8 in. BB	3/8 in. BB	3/8 in. BB	3/8 in. BB	3/8 in. BB	3/8 in. BB	3/8 in. BB	3/8 in. BB	3/8 in. BB	3/8 in. BB
Ditto ditto Cross Tubes	1 1/8 in. BB	1 1/8 in. BB	1 1/8 in. BB	1 1/8 in. BB	1 1/8 in. BB	1 1/8 in. BB	1 1/8 in. BB	1 1/8 in. BB	1 1/8 in. BB	1 1/8 in. BB	1 1/8 in. BB
Ditto ditto Up-take	3/8 in. BB	3/8 in. BB	3/8 in. BB	3/8 in. BB	3/8 in. BB	3/8 in. BB	3/8 in. BB	3/8 in. BB	3/8 in. BB	3/8 in. BB	3/8 in. BB
Ditto ditto Crowns	3/8 in. BB	3/8 in. BB	3/8 in. BB	3/8 in. BB	3/8 in. BB	3/8 in. BB	3/8 in. BB	3/8 in. BB	3/8 in. BB	3/8 in. BB	3/8 in. BB
Approximate Weight of Boiler in cwt.	9	12	17	20	24	27	30	34	37	40	44
Price of Boiler, as specified above	£ 21 0	£ 27 0	£ 36 0	£ 42 0	£ 50 0	£ 57 0	£ 62 0	£ 70 0	£ 75 0	£ 82 0	£ 89 0
Extra for Fire Box of Lowmoor	3 15	4 0	5 0	5 10	6 0	6 10	7 0	8 10	10 5	11 0	12 0
Ditto Cross Tubes of Lowmoor	0 10	1 0	1 5	1 10	2 5	2 5	3 5	3 15	5 0	5 0	6 0
Ditto Ashpit	2 0	2 0	2 10	2 15	3 5	3 5	3 10	3 15	4 0	4 0	4 0
Ditto Base Plate	1 10	1 10	2 0	2 5	2 10	2 10	3 0	3 5	3 10	3 10	3 10
Ditto Fire Bars	1 0	1 0	1 5	1 7/6	1 12/6	1 12/6	2 0	2 10	2 15	2 15	2 15
Ditto Mountings	6 10	6 10	7 10	7 10	8 0	8 0	8 0	9 0	10 0	11 0	12 0
Hydraulic Test, per square inch	150	150	150	140	140	140	140	140	130	130	130

Mountings include Safety Valve, Pressure Gauge, Water Gauge, Gauge Cocks, Check Valve, Stop Valve, and Blow-off Cock.  
Fire Door is included in price of Boiler.

"B" indicates "Staffordshire Best," and "BB" Staffordshire Best Best" Plates.

ALEX. WILSON AND CO.,

ENGINEERS, VAUXHALL IRON-WORKS, NINE ELMS, LONDON, S.W.

## PORTABLE BOILERS.

Nominal Horse-power	2	4	6	8	10	12	15	20	25	30
Size across Front	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.
Width of Casing	2 2	3 3	3 7	3 9	3 9	3 9	3 9	4 0	4 3	4 6
Height of ditto	1 9	2 1	2 0	2 4	2 6	2 10	3 0	3 6	4 0	4 3
Length of Barrel	3 9	4 6	5 8	6 0	6 6	6 9	7 0	7 6	8 0	8 6
Diameter of ditto	1 9	2 2	2 6	2 8	2 9	3 0	3 3	3 7	3 9	4 0
Number of Tubes	12	18	24	28	32	33	40	46	52	60
Diameter of ditto	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 3/4	2 3/4	2 3/4	2 3/4	2 3/4
Thickness and Quality of Barrel	1/8 B	1/8 B	3/8 B	3/8 B	3/8 B	3/8 B	3/8 B	3/8 B	1/2 B	1/2 B
Ditto ditto	1/8 LM	1/8 LM	3/8 LM	3/8 LM	3/8 LM	3/8 LM	3/8 LM	3/8 LM	1/2 LM	1/2 LM
Ditto ditto	1/8 LM	1/8 LM	1/8 LM	1/8 LM	1/8 LM	1/8 LM	1/8 LM	1/8 LM	1/8 LM	1/8 LM
Ditto ditto	1/8 BB	1/8 BB	1/8 BB	1/8 BB	1/8 BB	1/8 BB	1/8 BB	1/8 BB	1/8 BB	1/8 BB
Ditto ditto	1/8 BB	1/8 BB	1/8 BB	1/8 BB	1/8 BB	1/8 BB	1/8 BB	1/8 BB	1/8 BB	1/8 BB
Ditto ditto	1/8 B	1/8 B	1/8 B	1/8 B	1/8 B	1/8 B	1/8 B	1/8 B	1/8 B	1/8 B
Approximate Weight of, in cwts.	15	23	28	33	42	50	59	71	85	90
Price of Boiler, as specified above	£ 35	£ 47	£ 58	£ 68	£ 79	£ 90	£ 115	£ 138	£ 160	£ 190
Extra for Aspit	1 10	2 0	2 0	2 10	2 15	3 0	3 5	3 10	4 0	4 10
Ditto Chimney and Base	2 10	3 0	3 10	3 15	3 15	4 0	4 10	5 0	5 0	5 10
Ditto Fire Bars	1 0	1 10	1 15	2 0	2 5	2 15	3 0	3 10	4 0	4 10
Ditto Mountings	6 10	7 10	8 0	8 0	10 0	12 0	15 0	20 0	25 0	30 0
Hydraulic Test, per square inch	120	120	120	120	120	120	120	120	120	120

Mountings include Safety Valve, Stop Valve, Check Valve, Pressure Gauge, Water Gauge, Gauge Cocks, and Blow-off Cock. "B" indicates "Staffordshire Best," and "BB" "Staffordshire Best Best" Plates. "LM" indicates "Low Moor," or "Bowling," or "Farnley" Plates.

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	5	6	7	8	10	12	14	15	16
	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.
	No.	No.	No.	No.	No.	No.	No.	No.	No.
Nominal Horse-power .. .. .	..	..	..	..	..	..	..	..	..
Diameter of Boiler .. .. .	4 0	4 0	4 6	4 6	5 0	5 0	5 6	5 6	5 6
Length of ditto .. .. .	5 6	6 0	6 0	6 6	6 0	7 0	7 0	7 6	8 0
Diameter of Flue .. .. .	2 0	2 0	2 3	2 3	2 6	2 6	2 9	2 9	2 9
Length of ditto .. .. .	4 0	4 3	4 3	4 9	4 3	5 0	5 0	5 6	6 0
Diameter of Tubes .. .. .	0 2½	0 2½	0 2½	0 2½	0 2½	0 2½	0 2½	0 2½	0 2½
Number of ditto .. .. .	26	28	34	34	44	44	50	50	50
Depth of Combustion Chamber .. .. .	1 2	1 5	1 5	1 5	1 5	1 6	1 6	1 6	1 6
Diameter of Dome .. .. .	1 6	1 6	1 9	1 9	1 9	1 9	1 9	1 9	1 9
Height of ditto .. .. .	1 9	1 9	2 0	2 0	2 0	2 0	2 0	2 3	2 3
Diameter of Funnel .. .. .	0 9	0 9	0 10	0 10	0 10	0 10	0 10	0 10	0 10
Height of ditto .. .. .	6 0	6 0	8 0	8 0	10 0	10 0	10 0	10 0	10 0
Thickness and Quality of Shell .. .. .	in. B ¾	B ¾	B ¾	B ¾	B ¾	B ¾	B ¾	B ¾	B ¾
Ditto .. .. .	in. BB ¾	BB ¾	BB ¾	BB ¾	BB ¾	BB ¾	BB ¾	BB ¾	BB ¾
Ditto .. .. .	in. LM ¾	LM ¾	LM ¾	LM ¾	LM ¾	LM ¾	LM ¾	LM ¾	LM ¾
Ditto .. .. .	in. LM & ¾	LM & ¾	LM & ¾	LM & ¾	LM & ¾	LM & ¾	LM & ¾	LM & ¾	LM & ¾
Ditto .. .. .	in. LM & ¾	LM & ¾	LM & ¾	LM & ¾	LM & ¾	LM & ¾	LM & ¾	LM & ¾	LM & ¾
Ditto .. .. .	in. BB ¾	BB ¾	BB ¾	BB ¾	BB ¾	BB ¾	BB ¾	BB ¾	BB ¾
Ditto .. .. .	in. ft. 1 8	ft. 1 8	ft. 1 8	ft. 1 8	ft. 1 8	ft. 1 8	ft. 1 8	ft. 1 8	ft. 1 8
Approximate Heating Surface of Tubes .. .. .	60	70	86	104	119	140	163	180	198
Ditto .. .. .	22	24	29	34	39	46	54	60	66
Ditto .. .. .	6	7	8	9	10	11	12	13	14
Ditto .. .. .	cwt. 27	cwt. 30	cwt. 43	cwt. 49	cwt. 58	cwt. 65	cwt. 73	cwt. 77	cwt. 82
Weight of Boiler, cwt.s. .. .. .	..	..	..	..	..	..	..	..	..
Price of Boiler, as specified above .. .. .	..	..	..	..	..	..	..	..	..
Extra for Furnace Fittings .. .. .	..	..	..	..	..	..	..	..	..
Ditto Mountings .. .. .	10 0	10 0	11 0	11 0	12 0	12 0	13 0	13 0	13 0
Hydraulic Test, per square inch .. .. .	150	150	150	150	140	140	130	130	130

Mountings include Safety Valve, Spring Balances, Pressure Gauge, Water Gauge, Gauge Cocks, Check Valve, Blow-off and Scum Cocks. Smoke Box and Funnel are included in price of Boiler.

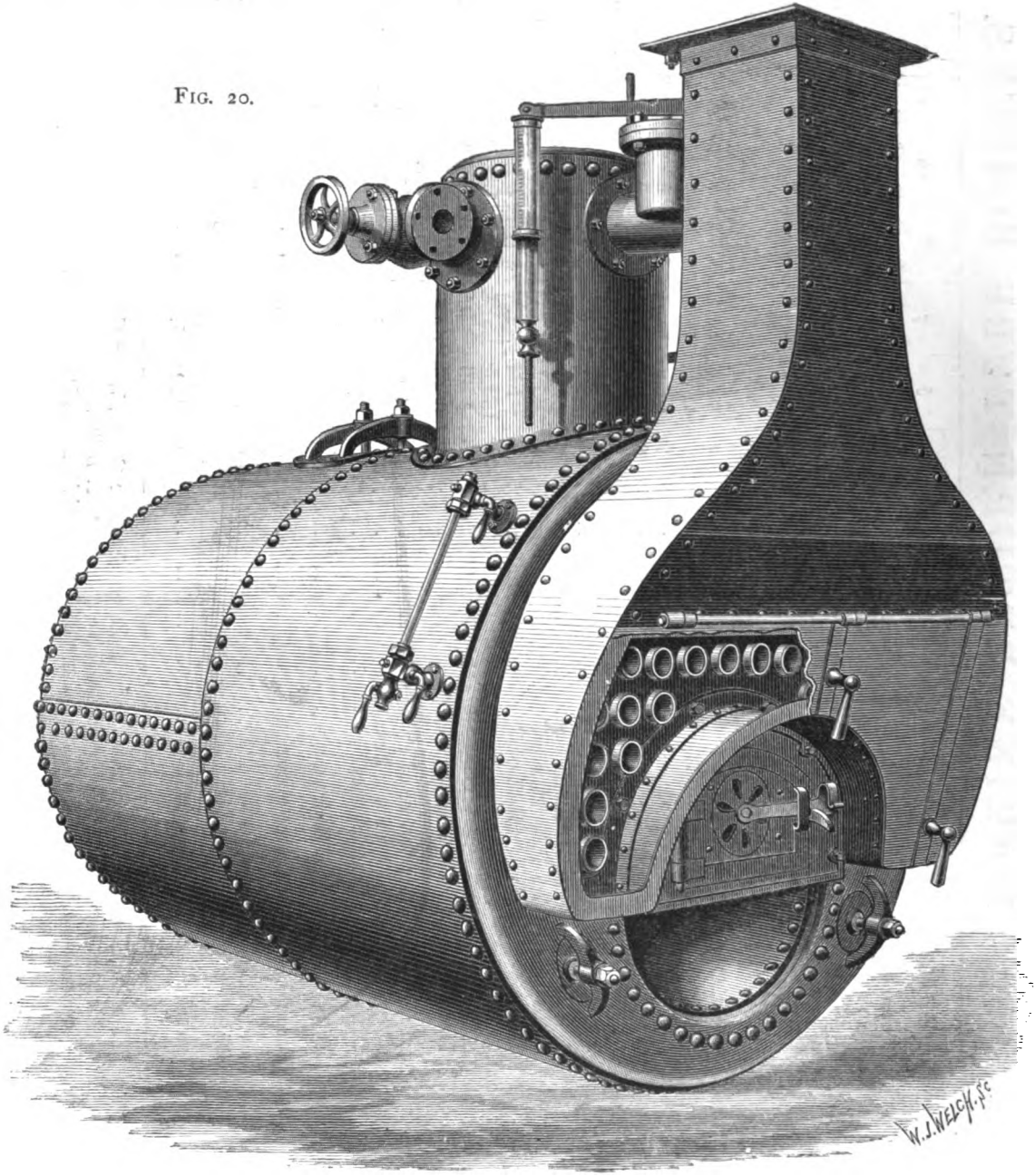
"B" indicates "Staffordshire Best," and "BB" "Staffordshire Best Best" Plates. "LM" indicates "Low Moor," Bowling, or "Farnley" Plates.

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## MARINE RETURN TUBE BOILER.

The annexed engraving, Fig. 20, represents a High-Pressure Return Tube Boiler, of 7 Horse-power, 4 feet 6 inches diameter and 6 feet long, as used for one of our Screw Engines. The wood-cut has been copied from a photograph, and is an accurate representation of the style of Boiler. For prices of these Boilers see Price List on previous page, and also the Tabular Price of our Screw Engines, Boilers, &c., pages 36 and 37.

FIG. 20.



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## SCREW PROPELLERS.

FIG. 21.

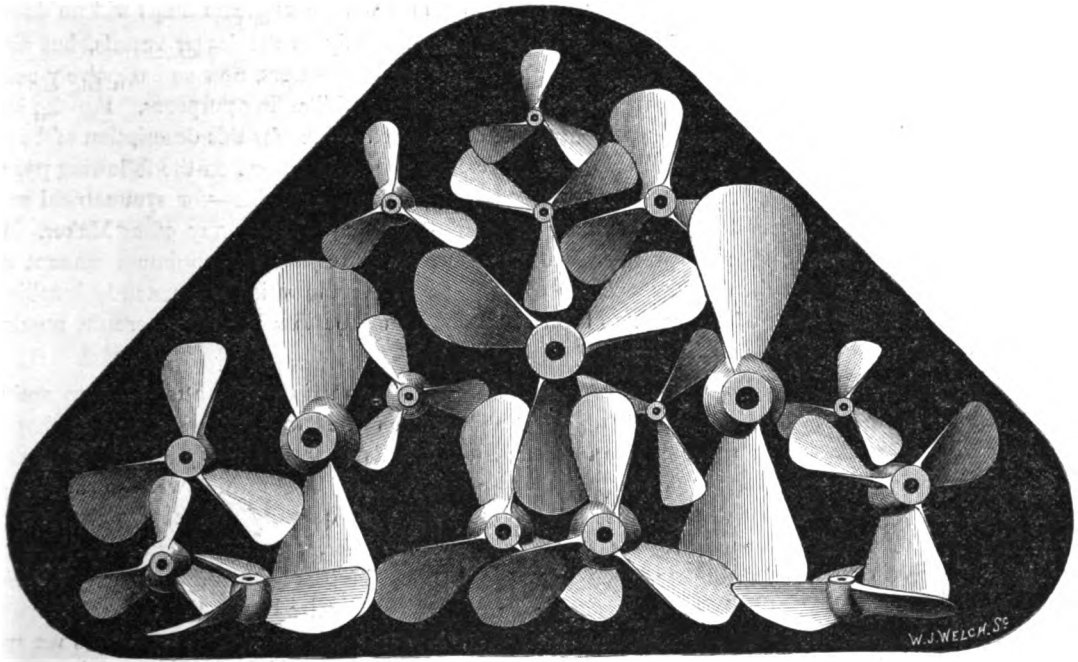


Fig. 21 represents a group of Two and Three-bladed Propellers, of which we have a large Stock of patterns of various diameters and pitches.

We supply them in Gun Metal, Cast Iron, Cast Malleable Iron, or Cast Steel, and they can be sent either bored to dimensions with Keyways cut or unbored. The following Table gives a few of the pitches and diameters which will serve as a guide, but we can supply any size up to 10 feet diameter, 2 blades, 3 blades, or 4 blades, true screws or with varying pitches. We can also supply Hirsch's and other patent Screws, prices for which, including Royalty, vary from £2 to £4 per nominal horse-power, but exact prices will be given on application.

Diameter .. ..	1' 9"	1' 11"	2' 0"	2' 2"	2' 2"	2' 3"	2' 6"	2' 9"	2' 9"	3' 0"	3' 6"	3' 6"	3' 9"	4' 0"	4' 6"	5' 4"
Pitch .. ..	3' 0"	3' 0"	3' 0"	3' 6"	5' 0"	4' 0"	3' 6"	3' 0"	4' 0"	5' 6"	5' 6"	6' 6"	5' 0"	5' 0"	7' 3"	9' 6"
Right or Left ..	L	L	L	L	L	R&L	R	R&L	L	R&L	L	L	L	L	R	R
No. of Blades ..	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2
Approx. Weight in lbs. ....	35	38	42	74	80	73	52	96	115	200	238	240	189	320	463	584
Price in Cast Iron	1 8	1 10	1 15	2 5	2 10	2 5	2 6	3 0	3 10	5 0	6 0	6 0	5 0	6 0	9 0	11 0
Price in Gun Metal	2 15	3 0	3 10	5 10	6 0	5 10	4 10	7 10	9 0	15 0	18 0	18 0	15 0	24 0	35 0	45 0

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F

## HIGH-PRESSURE SCREW ENGINES.

The great development of Steam Power during the last twenty years has in no department been more extensive than in that of our Mercantile Marine, and in a few years Steam Ships will no doubt monopolize the whole of the carrying trade. This applies not only to the larger vessels, but also to the great development of small vessels for the navigation of Inland waters, now so extensively used for purposes of pleasure as well as for carrying passengers and general Trading purposes. For the last seven years we have given great attention to small high-pressure Engines for this description of boat, both single and double cylinder, and we have only to refer to the Illustrations on the following pages for the proof that the result of our labours has been to produce Engines which—for symmetrical and substantial design both in general arrangement and in detail—are unequalled by any other Maker. It has been our constant endeavour to produce machinery that will require the minimum amount of repairs, as it is the most mistaken policy possible to purchase an Engine which is constantly breaking down, perhaps at a most critical moment, and when the boat may be in a locality where the repairs may cost as much as the original price of the Engine.

A great many Manufacturers have entered this field of Engineering, and attempted to make Engines at prices far lower than ordinary Stationary Engines when fitted with reversing gear, so that it was impossible for them to put either good and sufficient materials or workmanship into them for the money. Another way of cutting down the price has been to specify Boilers which were so small and deficient in heating surface that it was impossible to get a sufficient quantity of Steam, and this has been especially felt in the case of Engines sent abroad, where inferior or deteriorated fuel has of necessity often to be used. The Boilers specified for our various Engines have ample capacity for the supply of Steam, as that is a condition of success which we have recognized from the first. We have laid down Special Machinery for the manufacture of these Engines, so that with our facilities we are confident that better value can nowhere be obtained; and we have had the satisfaction of supplying them to many eminent Engineers, who have preferred entrusting us with the work rather than make this class of Engine for themselves; and also to several Public Companies at home and abroad, and in every case they have given entire satisfaction.

In compiling the following Tables of Dimensions and Prices, we have especially had in view the convenience of our Foreign correspondents who build their own boats, and we believe they will there find all the necessary information to enable them to order the Engines they require without having to undergo the delay necessitated by their first requiring an estimate. The lengths from centre of Engine to aft extremity of Propeller Shaft, and also the lengths of Stern Tube, are given as those we should send out if not otherwise ordered. Boats having Twin Screws require considerably longer Stern Tubes than those having only single ones, and in their case we must have the approximate distance from centre of Engine to Propellers.

The Boilers specified in our Lists, except for a few of the smaller sizes, are Return Tube Boilers, as that type is the shortest possible on the line of keel, and keeps the centre of gravity low; but we can supply any type giving the same amount of heating surface for the same price, Locomotive or Vertical Tubular. We can also supply the Field, Davey Paxman, and other Patent Boilers by special arrangement. We also supply small Compound Screw-Engines, Surface Condensing Engines, Twin-Screw Engines, fitted on each side of fire box of Locomotive Boilers, Diagonal Engines, Paddle Engines, &c. Prices of which we will give on receipt of specification of requirements.

Quotations given for Iron and Wooden Boats, complete with Engines, &c.

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ENGINEERS, VAUXHALL IRON-WORKS, NINE ELMS, LONDON, S.W.



## HIGH-PRESSURE SCREW ENGINES.

Fig. 22 represents the Transverse Section, and Fig. 23 the Longitudinal Section of the after-part of a Boat, with one of our 14-horse Double-Cylinder Screw Engines fitted to it. They are drawn to a Scale of  $\frac{1}{4}$  inch to the foot, and give an exact representation of the whole machinery as actually fitted into a Boat. The Engine has a pair of Cylinders, 8 inches diameter, 9 inches stroke, as shown at Fig. 35. The Boiler is 5 feet 6 inches diameter, 7 feet long, with fifty Return Tubes  $2\frac{1}{2}$  inches diameter. The Propeller is 4 feet diameter and 5 feet pitch.

CROSS SECTION  
OF BOAT.

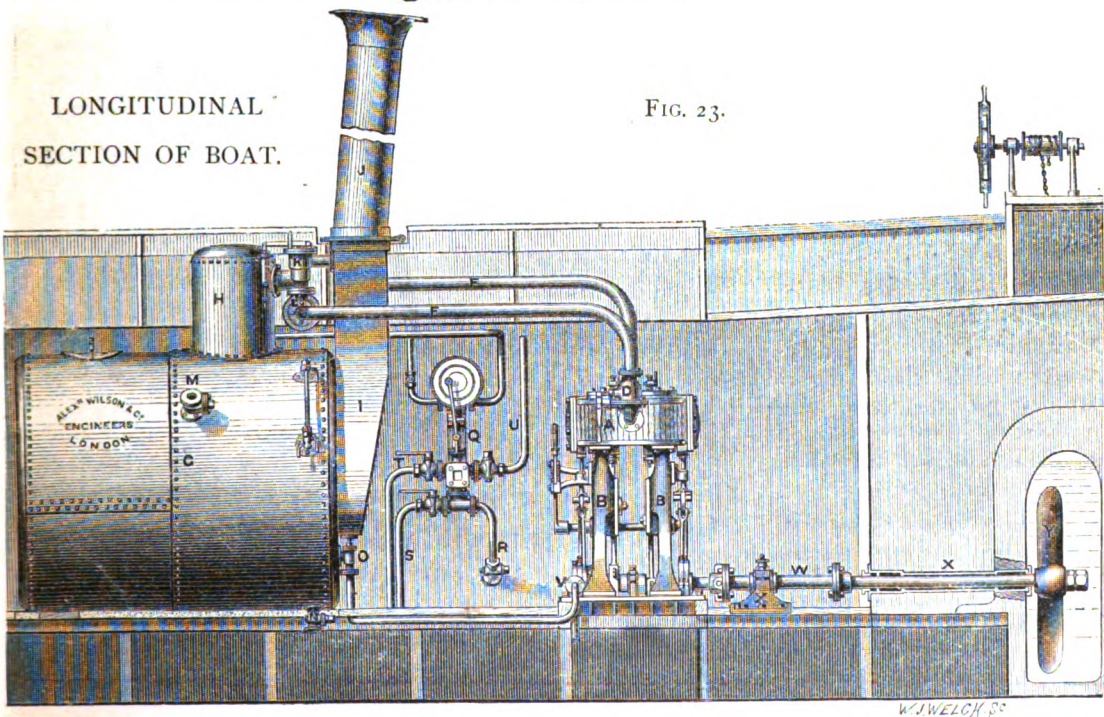
FIG. 22.

### REFERENCES.

- A—Cylinders of Engine.
- B—Frames of Engine.
- C—Bed Plate of Engine.
- D—Steam Regulator.
- E—Steam Pipe.
- F—Exhaust Pipe.
- G—Boiler.
- H—Dome.
- I—Smoke Box.
- J—Funnel.
- K—Safety Valves.
- L—Stop Valve.
- M—Scum Cock and Pipe.
- N—Blow-off Cock and Pipe.
- O—Check Valve for Pump.
- P—Check Valve for Donkey.
- Q—Donkey Pump.
- R—Cock and Pipe from Sea.
- S—Cock and Pipe from Bilge.
- T—Cock and Pipe to Boiler.
- U—Cock and Pipe to Deck.
- V—Feed Pump on Engine.
- W—Intermediate Shaft.
- X—Propeller Shaft and Stern Tube.
- Y—Propeller.
- Z—Thrust Block.

LONGITUDINAL  
SECTION OF BOAT.

FIG. 23.



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*Table of Dimensions and Prices of Single-Cylinder  
Screw Engines.*

Nominal Horse-power .. .. .	2	2½	3	3½	5	7	9	12	15	20	28
Diameter of Cylinder .. .. .	4½"	5"	5½"	6"	7"	8"	9"	10"	12"	14"	16"
Stroke of Engine .. .. .	4½"	5"	6"	6"	7"	8"	9"	11"	12"	14"	16"
Height over all .. .. .	2' 6½"	2' 8½"	3' 4"	3' 6½"	3' 10½"	4' 5"	5' 1½"	5' 7½"	6' 1½"	6' 7"	7' 0"
From under side of Bed Plate to centre of Crank Shaft .. .. }	4½"	5"	5½"	6½"	6½"	7½"	9"	10"	11"	1' 0"	1' 2"
Length of Bed Plate on Keel ..	1' 4"	1' 6½"	1' 7"	1' 9"	1' 10½"	2' 0"	2' 1½"	2' 3"	2' 5"	2' 9½"	3' 2"
Distance from centre of Engine to face of Coupling .. .. }	11"	8½"	11"	12"	1' 1½"	1' 2½"	1' 4"	1' 5"	1' 7"	1' 9"	1' 11½"
Breadth athwards .. .. .	1' 4"	1' 5½"	1' 9"	1' 11"	2' 1½"	2' 5"	2' 8½"	3' 0"	3' 5½"	3' 11½"	4' 3½"
Diameter of Crank Shaft .. ..	1½"	1½"	2½"	2½"	2½"	3"	3½"	3½"	4"	4½"	4½"
„ Steam Pipe .. .. .	1"	1½"	1½"	1½"	1½"	2"	2"	2½"	3"	3½"	4"
„ Exhaust ditto .. .. .	1½"	1½"	1½"	1½"	2"	2½"	3"	3"	4"	4½"	5"
„ Pump Ram .. .. .	1"	1½"	1½"	1½"	2"	2"	2½"	2½"	2½"	3"	3½"
„ Propeller .. .. .	1' 11"	2' 2"	2' 3"	2' 6"	2' 9"	3' 0"	3' 3"	3' 6"	4' 0"	5' 0"	5' 6"
Pitch of ditto .. .. .	3' 0"	3' 6"	3' 9"	3' 9"	4' 0"	4' 6"	5' 0"	5' 6"	6' 0"	6' 6"	8' 0"
Diameter of Propeller Shaft ..	1½"	1½"	2½"	2½"	2½"	2½"	3"	3½"	3½"	3½"	4"
„ ditto, if in Steel ..	1½"	1½"	2"	2"	2½"	2½"	2½"	2½"	3"	3½"	3½"
Length of ditto to aft side of Pro- peller .. .. . }	6' 0"	6' 6"	5' 0"	6' 0"	6' 6"	7' 0"	7' 6"	8' 6"	9' 0"	10' 0"	11' 0"
Length of Intermediate Shaft ..	none.	none.	1' 6"	1' 6"	1' 8"	1' 10"	2' 2"	2' 6"	2' 6"	3' 0"	3' 3"
Length of Stern Tube between Flanges .. .. . }	1' 8"	1' 10"	2' 2"	2' 6"	2' 10"	3' 2"	3' 5"	3' 6"	3' 6"	4' 3"	4' 6"
Diameter of Boiler .. .. .	2' 9"	3' 0"	3' 6"	3' 9"	4' 0"	4' 6"	4' 6"	5' 0"	5' 6"	6' 3"	7' 0"
Length of ditto .. .. .	4' 2"	4' 9"	5' 4"	4' 6"	5' 6"	6' 0"	6' 6"	7' 0"	7' 6"	8' 0"	9' 0"
Diameter of Flue .. .. . }	2' 0"	2' 5"	2' 9"	1' 10½"	2' 0"	2' 3"	2' 3"	2' 6"	2' 9"	3' 0"	Two 2' 2"
„ Tubes .. .. .	1½"	1½"	1½"	2"	2½"	2½"	2½"	2½"	2½"	2½"	2½"
Number of ditto .. .. .	45	59	70	25	26	34	34	44	50	63	76
Diameter of Dome .. .. .	1' 2"	1' 4"	1' 6"	1' 6"	1' 6"	1' 9"	1' 9"	1' 9"	1' 9"	2' 3"	2' 6"
Height of ditto .. .. .	1' 0"	1' 6"	1' 9"	1' 8"	1' 9"	2' 0"	2' 0"	2' 0"	2' 3"	2' 3"	2' 6"
Total Heating Surface, sq. feet ..	29	46	62	68	82	115	138	186	228	343	431
Price of Engine .. .. .	£40	£48	£58	£60	£75	£100	£125	£150	£180	£240	£320
Extra if with two Pumps .. ..	£4	£5	£5	£5	£7	£7	£8	£10	£10	£12	£15
Weight of Engine in cwts. .. ..	2½	3	6	5½	7½	10½	13	18	26	38	50
Price of Propeller, Shaft, Stern Tube, and Thrust Bearing .. }	£12	£14	£16	£16	£18	£22	£26	£32	£40	£56	£70
Approximate weight of ditto in cwts.	1	1½	2½	2½	3½	4½	5½	6½	8½	11½	14
Price of Boiler and Fittings .. ..	£70	£80	£88	£92	£106	£131	£143	£170	£195	£255	£350
Approximate weight of ditto in cwts.	12	17	21	24	27	43	49	65	77	90	120
Extra for requisite lengths of Steam and Water Pipes, with Flanges ready for brazing .. .. }	£4	£4	£5	£6	£7	£8	£9	£10	£12	£15	£20
Extra for Donkey Pump with its Fittings and Pipes .. .. . }	£10	£10	£10	£10	£10	£13	£13	£17	£17	£19	£19

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*Table of Dimensions and Prices of Double-Cylinder Screw Engines.*

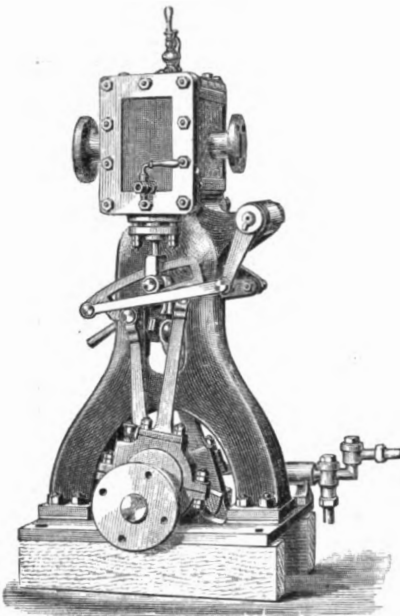
Nominal Horse-power .. .. .	3½	5	7	8	10	14	18	24	30	40
Diameter of Cylinder .. .. .	4"	5"	6"	6½"	7"	8"	9"	10"	12"	14"
Stroke of Engine .. .. .	5"	6"	7"	7½"	8"	9"	10"	12"	14"	18"
Height over all .. .. .	2' 8¼"	3' 2¼"	3' 8½"	3' 8½"	4' 3¼"	4' 9¼"	5' 2¼"	6' 9"	7' 3"	8' 6"
From under side of Bed Plate to centre of Crank Shaft .. .. .	4½"	5½"	6½"	6½"	7½"	8½"	9½"	10½"	1' 0"	1' 2"
Length of Bed Plate on Keel .. .. .	2' 0¼"	2' 3"	2' 7½"	2' 8½"	2' 9½"	3' 1½"	3' 6"	3' 10"	4' 2½"	4' 8"
Distance from centre of Engine to face of Coupling .. .. .	1' 3½"	1' 4½"	1' 7"	1' 7½"	1' 8"	1' 9½"	1' 2½"	1' 10"	2' 6"	3' 2"
Breadth athwart .. .. .	1' 6½"	1' 9½"	2' 0"	2' 1½"	2' 3½"	2' 6½"	2' 10"	3' 5½"	4' 2"	4' 8"
Diameter of Crank Shaft .. .. .	1½"	2"	2½"	2½"	3"	3½"	3½"	4"	4½"	5"
Diameter of Steam Pipe .. .. .	1½"	1½"	1½"	1½"	2"	2½"	3"	3½"	4"	5"
„ Exhaust ditto .. .. .	1½"	2"	2"	2"	2½"	3"	4"	5"	6"	7"
„ Pump Ram .. .. .	1½"	2"	2"	2½"	2½"	2½"	2½"	3"	3½"	4"
„ Propeller .. .. .	2' 2"	2' 6"	2' 9"	3' 0"	3' 3"	4' 0"	4' 6"	5' 0"	5' 6"	6' 0"
Pitch of ditto .. .. .	3' 6"	3' 6"	4' 0"	4' 0"	4' 6"	5' 0"	5' 6"	6' 6"	8' 0"	9' 0"
Diameter of Propeller Shaft .. .. .	1½"	2½"	2½"	2½"	3"	3½"	3½"	3½"	4"	4½"
„ ditto, if in Steel .. .. .	1½"	2"	2½"	2½"	2½"	2½"	3"	3½"	3½"	3½"
Length of ditto to aft side of Pro- peller .. .. .	6' 6"	6' 0"	7' 0"	7' 6"	8' 0"	8' 6"	9' 3"	10' 0"	11' 0"	12' 6"
Length of Intermediate Shaft .. .. .	none	1' 6"	1' 8"	1' 10"	2' 2"	2' 6"	2' 9"	3' 0"	3' 3"	3' 6"
Length of Stern Tube between Flanges .. .. .	2' 2"	2' 6"	3' 0"	3' 2"	3' 5"	3' 6"	3' 9"	4' 3"	4' 6"	5' 0"
Diameter of Boiler .. .. .	3' 9"	4' 0"	4' 6"	4' 6"	5' 0"	5' 6"	6' 0"	6' 6"	7' 3"	8' 0"
Length of ditto .. .. .	4' 6"	5' 6"	6' 0"	6' 6"	7' 0"	7' 6"	7' 6"	8' 0"	9' 6"	9' 6"
Diameter of Flue .. .. .	1' 10½"	2' 0"	2' 3"	2' 3"	2' 6"	2' 9"	2' 10½"	3' 2"	Two 2' 3"	Two 2' 4"
„ Tubes .. .. .	2"	2½"	2½"	2½"	2½"	2½"	2½"	2½"	2½"	2½"
Number of ditto .. .. .	25	26	34	34	44	50	58	81	86	102
Diameter of Dome .. .. .	1' 6"	1' 6"	1' 9"	1' 9"	1' 9"	1' 9"	2' 0"	2' 3"	2' 6"	2' 6"
Height of ditto .. .. .	1' 8"	1' 9"	2' 0"	2' 0"	2' 0"	2' 3"	2' 3"	2' 3"	2' 6"	2' 6"
Total Heating Surface, sq. feet .. .. .	68	82	115	138	186	240	302	356	541	614
Price of Engine .. .. .	£70	£90	£110	£125	£145	£190	£240	£280	£340	£420
Extra if with Two Pumps .. .. .	£5	£7	£7	£8	£8	£10	£10	£12	£15	£20
Weight of Engine in cwts. .. .. .	4	7½	11½	13	16	21	29	38	63	95
Price of Propeller, Shaft, Stern Tube, and Thrust Bearing .. .. .	£16	£18	£22	£25	£28	£39	£48	£60	£72	£90
Approximate weight of ditto in cwts. .. .. .	1½	2½	3½	4½	5½	7½	10½	12½	14½	19
Price of Boiler and Fittings .. .. .	£92	£106	£131	£143	£170	£195	£230	£285	£410	£470
Approximate weight of ditto in cwts. .. .. .	24	27	43	49	65	77	82	96	130	150
Extra for requisite lengths of Steam and Water Pipes, with Flanges ready for brazing .. .. .	£6	£7	£8	£9	£9	£10	£12	£15	£20	£30
Extra for Donkey Pump with its Fittings and Pipes .. .. .	£10	£10	£13	£13	£13	£17	£17	£19	£19	£22

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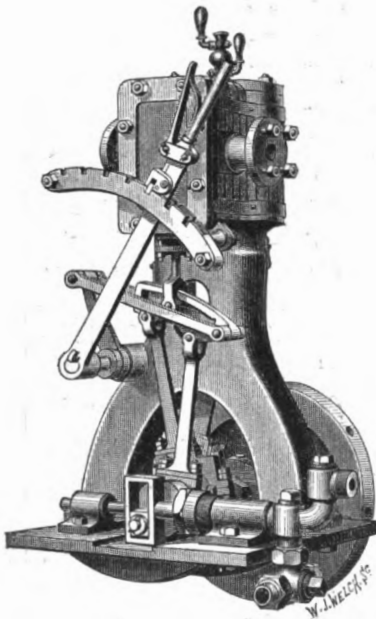
## SINGLE-CYLINDER SCREW ENGINES.

FIG. 25.



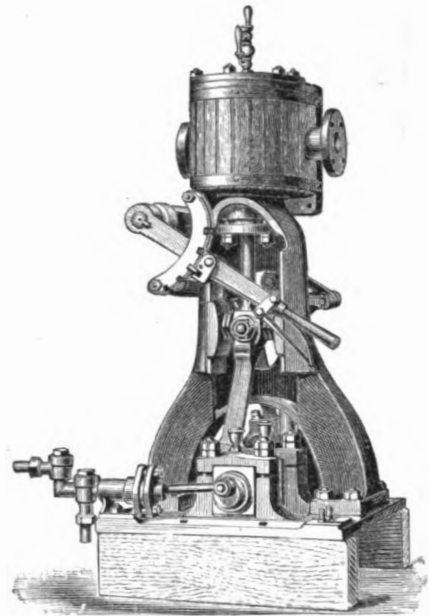
SINGLE-CYLINDER SCREW ENGINE.  
4½ inches diam., 4½ inches stroke.

FIG. 27.



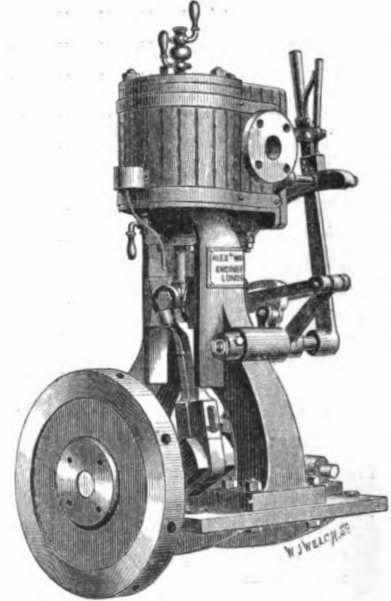
SINGLE-CYLINDER SCREW ENGINE.  
5 inches diam., 5 inches stroke.

FIG. 26.



SINGLE-CYLINDER SCREW ENGINE.  
4½ inches diam., 4½ inches stroke.

FIG. 28.



SINGLE-CYLINDER SCREW ENGINE.  
5 inches diam., 5 inches stroke.

Figs. 25 and 26 represent our Single-Cylinder Screw Engine, with Cylinder 4½ in. diameter, 4½ inches stroke. Figs. 27 and 28 represent our Single-Cylinder Screw Engine, 5 inches diameter, 5 inches stroke. All these four woodcuts are taken from photographs of the Engines as they are actually made, and give an accurate idea of the proportions we adopt. The Cylinder is cast in one piece with the Standard, which is of a substantial form, being cast hollow in the lower part, and the Guide Bars formed on the Standard, which being accurately planed in line with the Cylinder cannot be altered out of truth. The Guides are adjustable by screws on the cross-bend to take up wear. Feed Pumps are of Gun Metal. Crank Shaft, of the 4½-inch size, is of Bessemer Steel.

For Prices of these Engines, see our Tabular Price List on page 36.

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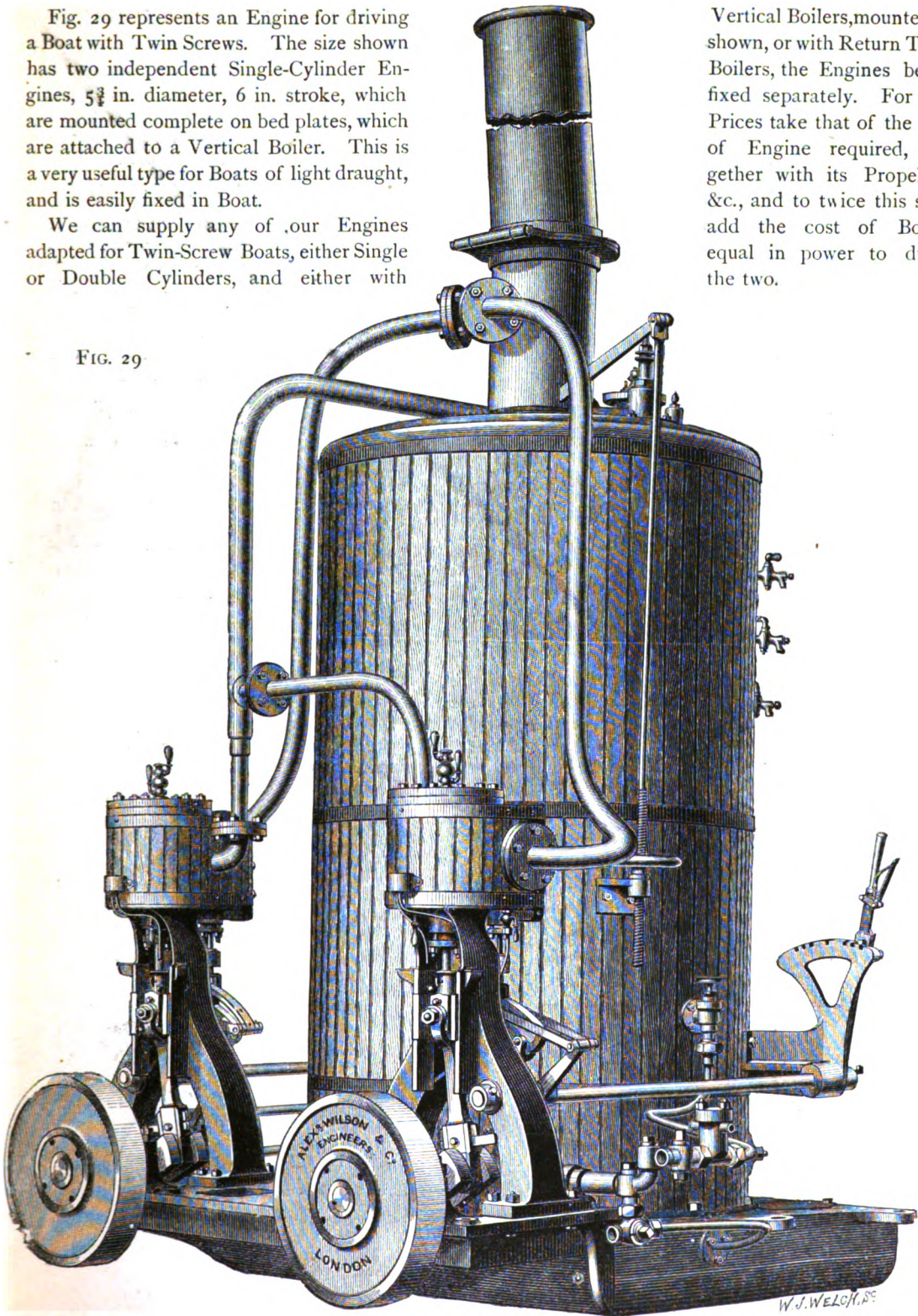
## TWIN-SCREW STEAM ENGINE.

Fig. 29 represents an Engine for driving a Boat with Twin Screws. The size shown has two independent Single-Cylinder Engines, 5½ in. diameter, 6 in. stroke, which are mounted complete on bed plates, which are attached to a Vertical Boiler. This is a very useful type for Boats of light draught, and is easily fixed in Boat.

We can supply any of our Engines adapted for Twin-Screw Boats, either Single or Double Cylinders, and either with

Vertical Boilers, mounted as shown, or with Return Tube Boilers, the Engines being fixed separately. For the Prices take that of the size of Engine required, together with its Propeller, &c., and to twice this sum add the cost of Boiler equal in power to drive the two.

FIG. 29



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## SINGLE-CYLINDER SCREW ENGINE.

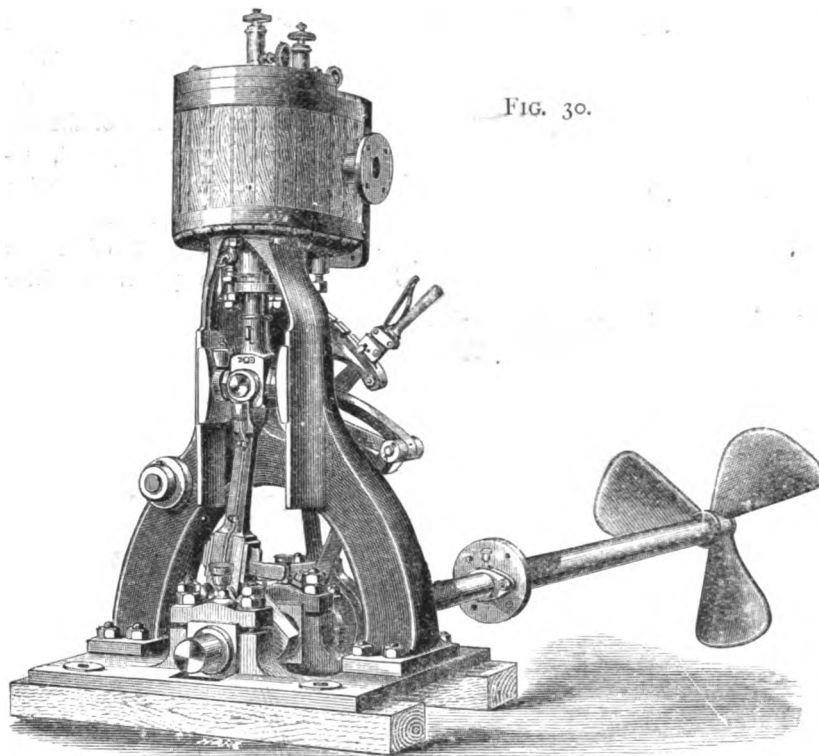


FIG. 30.

Figs. 30 and 31 represent our Single-Cylinder Screw Engine, having Cylinder 7 inches diameter, 7 inches stroke, with Propeller, Steam Tube, Propeller Shaft, and Thrust Bearing, taken from two different points of view and on two different scales. The woodcuts are taken from photographs, and give an accurate idea of the proportions which we adopt. The Stern Tube being for a Twin-Screw Boat, is shown of greater length accordingly.

The Cylinder, up to and including the 8-inch size of our single Engines, is cast in one piece with the Standard, which is of a most substantial form, being cast hollow in the lower part, and the Guide Bars are

formed on the Standard, which being accurately planed in line with the Cylinder, cannot be altered out of truth. This Engine is shown without Gun-Metal Feed Pump, but they can be supplied with or without one, or with both Feed and Bilge Pumps, as per Price List. Where it is possible, we always make the Propeller Shafts of our larger Engines above 5 horse-power in two pieces, the Thrust Bearing being formed in the part next the Engine, by the removal of which the other length can be drawn inward sufficiently to get the Propeller off. For Prices of these Engines, see our Tabular Price List, page 36.

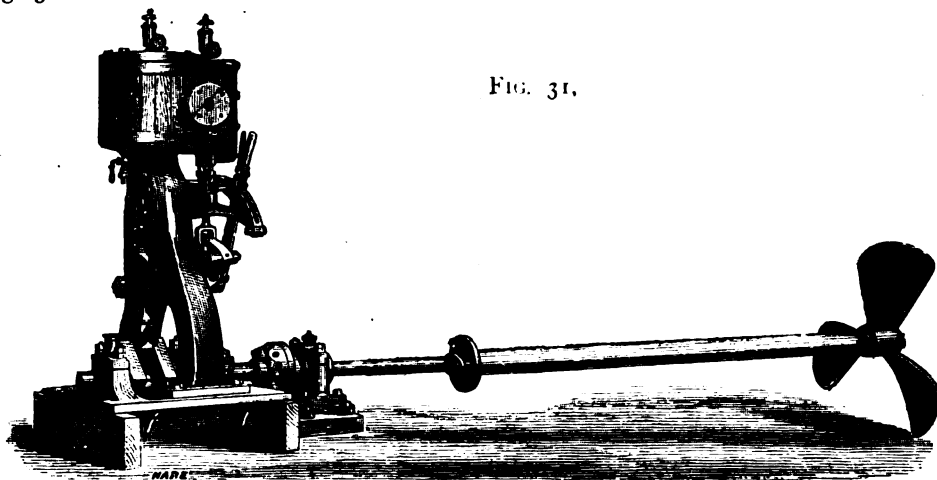


FIG. 31.

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## SINGLE-CYLINDER SCREW ENGINES.

Figs. 32 and 33 represent our Single-Cylinder Screw Engine, with cylinder 10 inches diameter, 11 inches stroke. The woodcuts have been copied from photographs of the Engines as made, and give an accurate idea of the proportions we adopt. The Engine is shown fitted with one Pump, but it can be

supplied with or without one, or with both Feed and Bilge Pumps. The cylinder is cast separate from the standard in all sizes of Single-Cylinder Engines above the 8-inch size. All the standards are now made of the box form cored out inside. (See Figs. 30, 31.) Single-Cylinder Engines fitted with Reversing Gear are not liable to stick on the centre. They are slightly cheaper, occupy less room on the line of the keel, but are a little higher than Double-Cylinder Engines of the same power.

For Prices of these Engines, see our Tabular Price List, page 36.

FIG. 32.

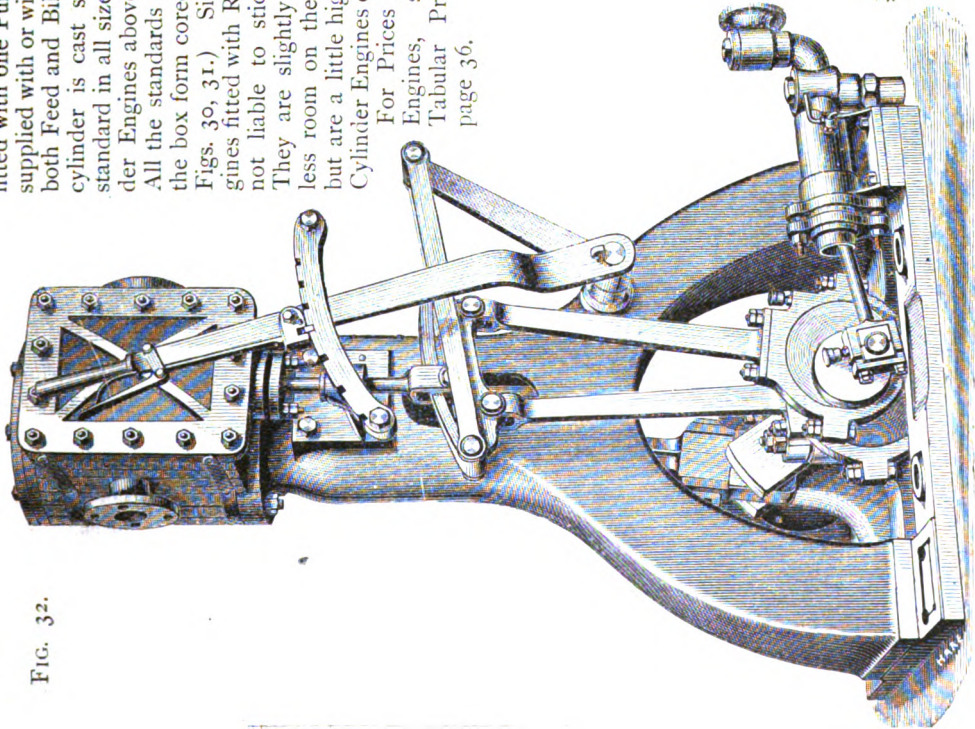
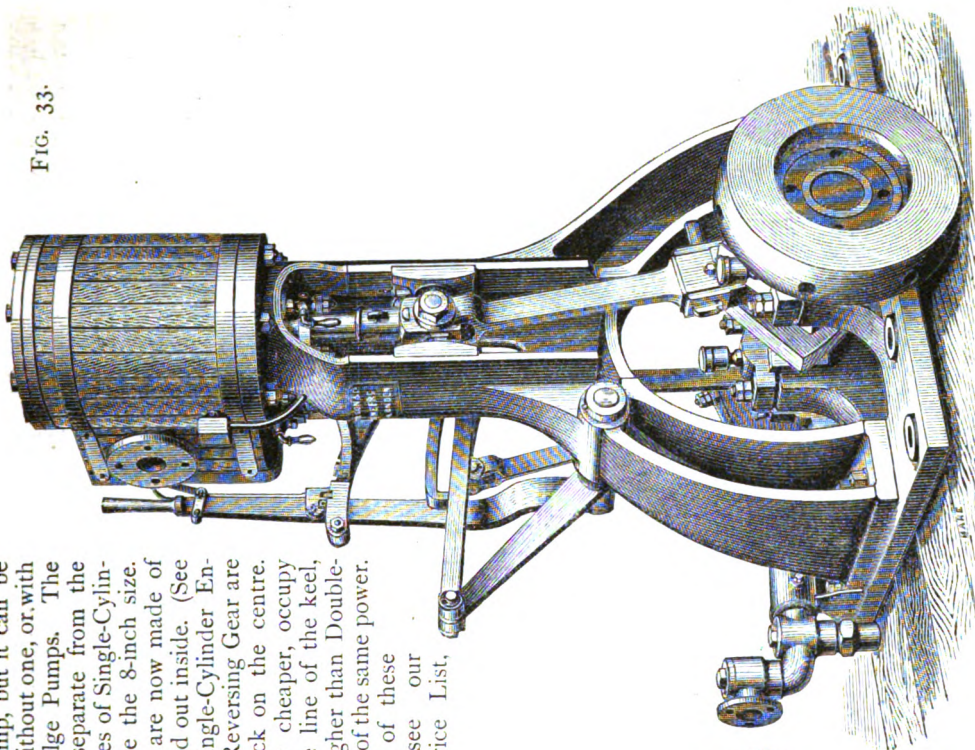


FIG. 33.



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G

## DOUBLE-CYLINDER SCREW ENGINES.

FIG. 34.

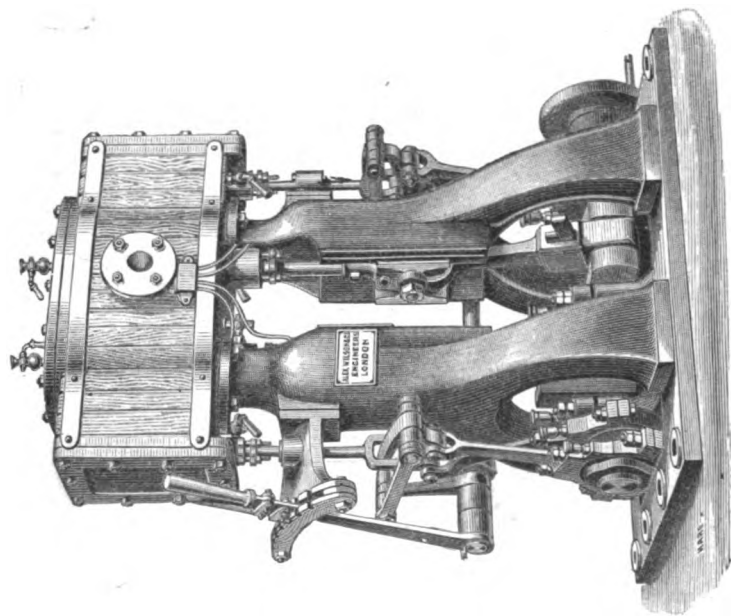


FIG. 35.

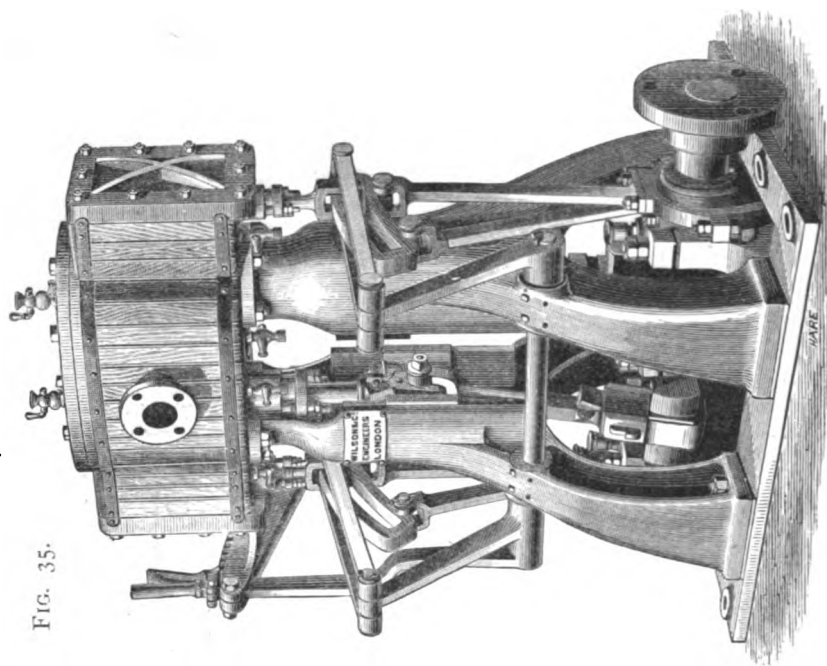


Fig. 34 represents our Double-Cylinder Screw Engine, with Cylinders 6 inches diameter, and 7 inches stroke; and Fig. 35 represents a similar Engine with Cylinders 8 inches diameter, and 9 inches stroke. The woodcuts have been copied from photographs of the actual Engines, and give an accurate idea of the proportions we adopt. The 8-inch size has now been altered in so far as it is fitted with guides to the valve spindles, same as the 6-inch size. This improvement—which prevents the gland from being worn oval—is applied to all our Engines except the two smallest sizes.

Double-Cylinder Engines cost only about 5 to 10 per cent. more than Single-Cylinder Engines of the same power when the Boiler is taken into account, as that must be the same for both. They have the advantage of being less in height, but they occupy more room on the line of the keel than Single-Cylinder Engines. For Prices of these Engines, see our Tabular Price List, page 37.

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## DOUBLE-CYLINDER SCREW ENGINES.

FIG. 36.

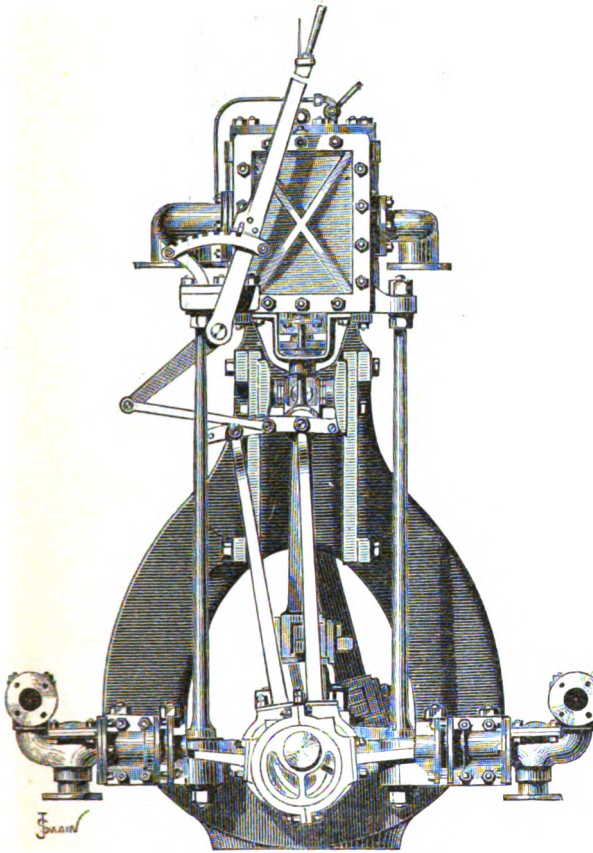


FIG. 37.

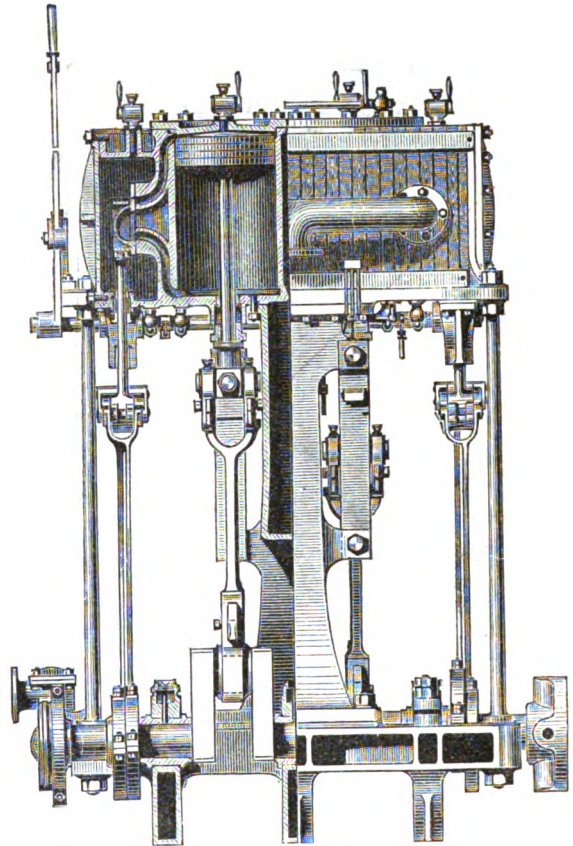


Fig. 36 is the end elevation, and Fig. 37 the side elevation, partly shown in section, of our Double-Cylinder Screw Engines, 14 inches diameter, and 18 inches stroke. We make all our Double-Cylinder Engines above 8 inches diameter on this design, which is of the most substantial description—as will be seen from the woodcuts: the general arrangement is somewhat similar to our usual pattern, except in regard to the framing. This consists of a central standard of massive design, and cast hollow to give great stiffness, to which the guide bars are attached on each side by means of projecting lugs. The base of this standard where it rests on the bed plate extends beyond the centre line of the cylinders, and in addition, the outer corners of the cylinders are supported by four turned wrought-iron stanchions or pillars, thus securing a framework of great rigidity combined with lightness, while every part of both Engines is perfectly accessible for the purpose of necessary adjustment. As shown in the woodcut, the reversing lever has been carried upwards so as to be worked from the deck, but it is always arranged to be worked from level of bed plate unless otherwise ordered. The other details are very similar in design to those already described, our chief care being to have all parts made so as to endure hard work. For Prices of these Engines, see our Tabular Price List, pages 36 and 37.

When required, the smaller sizes can be made to the above design at an extra cost of £5.

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G 2



FIG. 38.

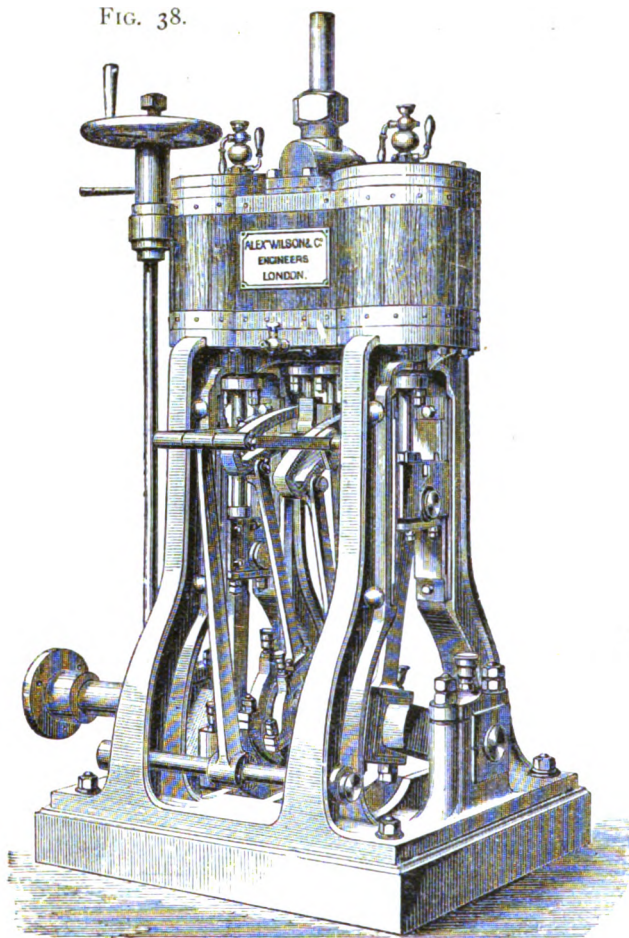


FIG. 39.

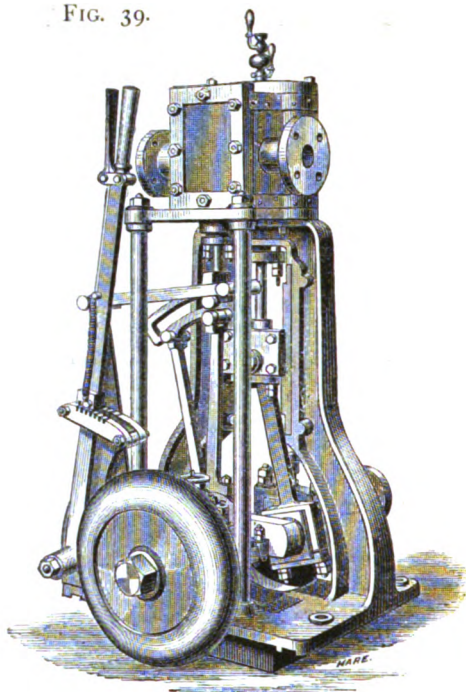
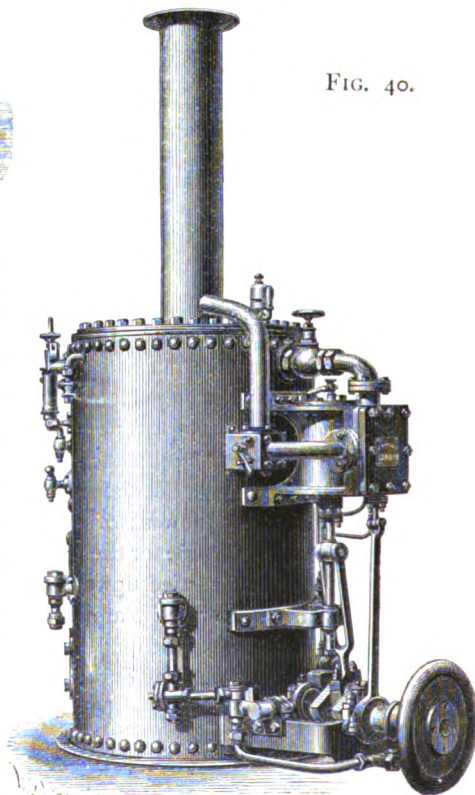


FIG. 40.



Figs. 38, 39, and 40 represent types of Screw Engines differing from our standard patterns, and they are only supplied to special order and quotation. Fig. 38 is a pair of 5-inch double Engines, 6 inches stroke, with valves inside, which though compact and all gear out of the way, has the disadvantage of not being readily accessible. Fig. 39 is a 5-inch single Engine, 6 inches stroke ; and Fig. 40 is a 5-inch single Engine, 6 inches stroke, attached to Boiler, which has the advantage of keeping down the weight of the machinery.

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## OVERHEAD STEAM TRAVELLER.

FIG. 41.

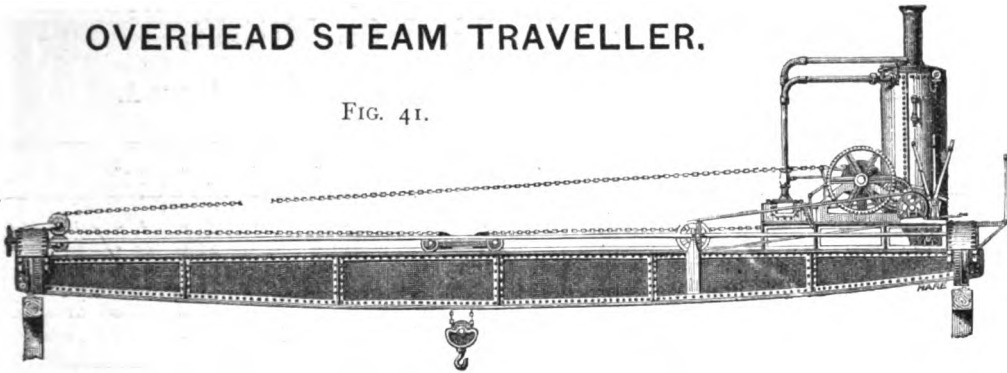


Fig. 41 represents an Overhead Steam Traveller, from which pattern the Cranes were made for removing the old and rebuilding the new Blackfriars Bridge, London. Five Cranes were used in this important work; and similar Cranes were also used at Victoria Railway Bridge, Pimlico; East Bute Dock, Cardiff; Limehouse Dock; and two can now be seen at work daily at the Stone Dépôt of the London and South-Western Railway, Nine Elms, close to the Vauxhall Iron-works. The advantage of this Steam Traveller over all others is that the Boiler, Engine, and Gearing are all fixed at one end, so that the Girders have only to carry the weights that are lifted, while the strain on the Gantry caused by the whole Engine travelling with the suspended load is entirely obviated.

Price of a Crane, with wrought-iron Girders, 40 feet Span and to lift 10 tons £500

Price of ditto, with trussed wooden Beams, 40 feet Span and to lift 10 tons £420

*Prices of different Spans and Capacities on application.*

## HAND TRAVELLER.

FIG. 42.

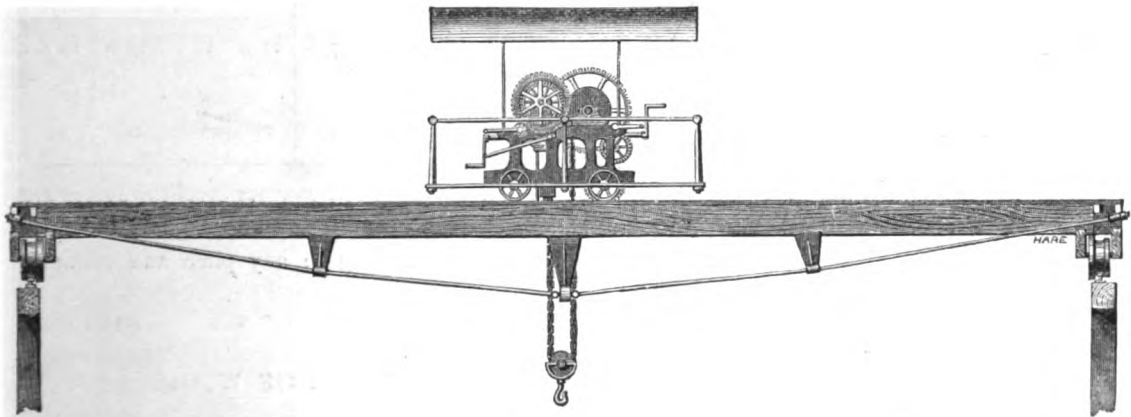


Fig. 42 represents a Hand Travelling-Crane which is too well known to need description.

Price of a Hand Crane, with trussed wood Beams, 40 feet Span and to lift 10 tons, £220.

*Prices of different Spans and Capacities on application.*

We also manufacture every description of Crane, Hoist, and Lift, worked by Steam, Hydraulic, or Hand Power.

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ENGINEERS, VAUXHALL IRON-WORKS, NINE ELMS. LONDON, S.W.

## PRICE LIST OF PULLEYS OR DRUMS,

All Turned on the face and edges and Bored.

Diam.	10"	12"	14"	15"	16"	18"	20"	21"	22"	24"	27"	30"	33"	36"	40"
Width on Face.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
4	8 0	10 0	11 6	12 3	13 0	14 9	15 6	17 3	18 0	19 6	23 0	25 6	28 0	30 6	33 0
6	11 0	13 3	15 6	16 6	18 0	19 0	20 9	22 9	24 0	26 0	30 6	34 0	37 6	41 0	44 0
8	13 9	16 6	19 6	20 6	23 0	24 6	26 0	28 3	30 0	32 6	38 3	42 6	47 0	51 0	55 0
10	16 6	19 9	23 6	24 9	28 0	29 6	31 3	33 9	36 0	39 0	46 0	51 0	56 0	61 0	66 0
12	19 3	23 0	27 6	28 9	33 0	34 9	36 6	39 3	42 0	45 6	54 0	60 0	66 0	72 0	77 0

Intermediate diameters and widths at proportionate rates, and larger sizes can be supplied. Split Pulleys are charged 20 per cent. extra. Cutting Keyways, 2s. 6d. to 4s. 6d. extra. Patent Wrought-iron Drums also supplied.

## PRICE LIST OF BRIGHT SHAFTING, PLUMMER BLOCKS, &c.

Diameters in Inches.	1½"	1½"	1¾"	2"	2½"	2½"	2¾"	3"	3½"	3½"	4	4½"
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Shafting, per foot .. .. .	2 6	2 8	3 0	3 6	4 6	5 6	6 0	7 0	10 0	11 6	14 0	17 6
Plummer Blocks, fitted with Lieuvain's Lubricators, each Extra, if fitted with Top Brasses .. .. .	10 0	12 6	14 0	15 6	18 0	22 0	25 0	30 0	36 0	45 0	56 0	72 6
Plummer Blocks, fitted with White Metal Bearings Top and Bottom, each .. .. .	1 6	2 0	2 3	2 6	3 0	4 0	5 0	6 0	7 6	10 0	12 0	14 0
Turned Couplings, fitted with Bolts, and Keyways cut, each .. .. .	7 6	9 0	10 6	12 0	14 0	16 0	18 6	24 0	30 0	40 0	50 0	60 0
Turned Collars, fitted with Set Screws .. .. .	2 6	2 8	3 0	3 6	4 6	5 6	6 0	7 6	11 0	12 0	15 0	19 6
Weight of Shafting per foot, in lbs. .. .. .	4½	6	8	10½	13½	16½	20½	24	28	32½	42½	54

Odd lengths of Shafting are charged 10 per cent. extra. If made of Bessemer Steel the Prices are 50 per cent. extra. We also supply Wall Boxes and Brackets of various designs to support Plummer Blocks; also Hangers fitted with Brasses. Spur Wheels and Pinions to any pitch and diameter moulded by Machine.

## PRICES OF SAW SPINDLES FOR BENCHES MADE OF WOOD.

Diameter of Spindle .. .. .	1½"	1½"	1¾"	2"	2½"	2½"	2¾"	3"
Length from Outer End to Saw .. .. .	3' 3"	3' 6"	3' 9"	3' 11"	4' 3"	4' 8"	5' 0"	5' 6"
Diameter of Fast and Loose Pulleys .. .. .	6"	8"	8"	9"	10"	1' 0"	1' 2"	1' 4"
Width of ditto .. .. .	4"	5"	6"	6"	6"	7"	8"	9"
Suitable for Diameter of Saw of .. .. .	1' 6"	2' 0"	2' 6"	3' 0"	3' 6"	4' 0"	5' 0"	6' 0"
Price .. .. .	£3 5s.	£4 4s.	£5 2s.	£6	£7 4s.	£8 15s.	£10 4s.	£12

ALEX. WILSON AND CO.,

ENGINEERS, VAUXHALL IRON-WORKS, NINE ELMS, LONDON, S.W.

# MICHELE'S PATENT CEMENT-TESTING MACHINE.

ITS ADVANTAGES ARE :—

1. **CHEAPNESS.**      2. **ACCURACY.**      3. **PORTABILITY.**

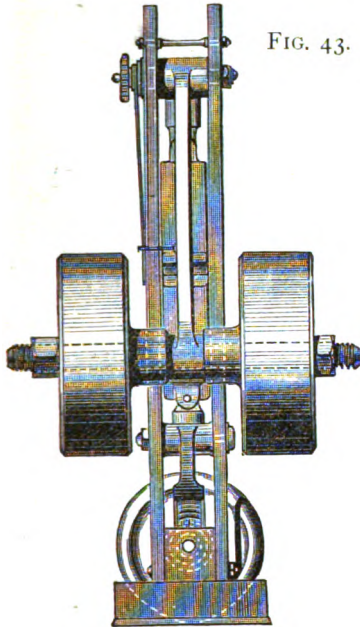


FIG. 43.

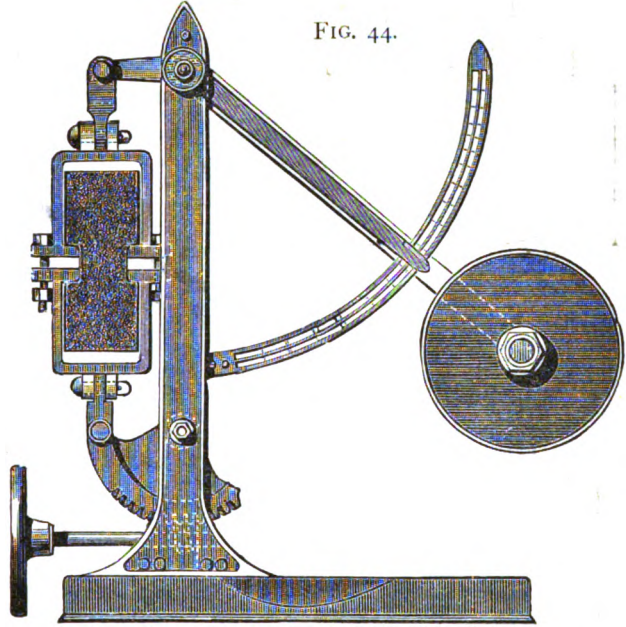


FIG. 44.

The block to be tested is placed in the jaws prepared to receive it; the handle is then turned, which raises the weighted lever by exerting a pull on its short end through the medium of the cement block. When the leverage is so increased as to exert a force too great for the cement to sustain, it breaks, and the lever falls, leaving the index-pointer at the spot to which it had been raised. The arc along which the pointer moves is graduated to show the number of pounds of tensile strain applied. A suitable arrangement, when the cement block breaks, prevents the lever from falling more than half an inch.

As the force is thus gradually applied to the block of cement, it is impossible that its breaking point can be influenced by any jerk or uneven strain.

## MICHELE'S CEMENT-TESTING MACHINES

Are now generally specified to be employed on all large Works where Cement is extensively used, and no Resident Engineer should be without one.

They are now used on all Public Works carried out by

HER MAJESTY'S WAR DEPARTMENT.

THE ADMIRALTY.

H.M.'S PUBLIC WORKS DEPARTMENT, INDIA.

THE CROWN AGENTS OF THE COLONIES.

Also by many Dock Boards, Harbour Commissioners, Railway Companies, and the leading Civil Engineers, Contractors, and Cement Manufacturers.

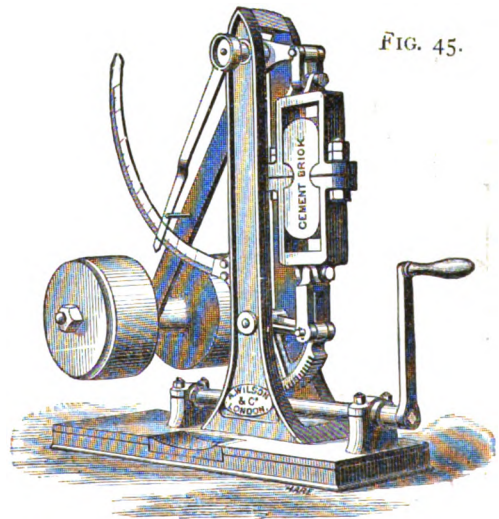


FIG. 45.

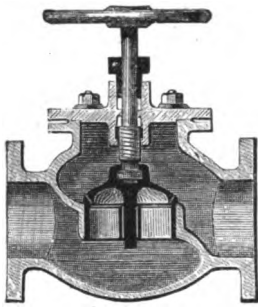
Price of a Machine to exert a tensile strain not exceeding 1000 lb.	.. .. .	£24
" " " " " " 1200 lb.	.. .. .	£26
" " " " " " 1500 lb.	.. .. .	£28
Price of Gun-Metal Moulds, accurately made for Section, 1 in. by 1 in.	.. .. .	£1 5s. each
" " " " " " 1½ in. by 1½ in.	.. .. .	£1 10s.

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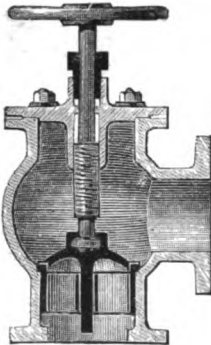


FIG. 46.



We beg to call attention to our improved manufacture of "*Steam Stop-Valves*," which, in Materials, Workmanship, and Finish, are very superior to any in the Market, while the prices are not at all increased. Engineers have hitherto experienced a great difficulty in obtaining a good and reliable Valve, many being made with the Nut cast on the Spindle, to save screw cutting, whilst some even have the threads cast in white metal. Others again are made with wrought-iron Spindles, which are continually sticking fast in the Nut, or the Spindle becoming eaten away with rust is never tight in the Stuffing Box. The Flanges and Wheels are also generally quite rough, and those who wish a superior article, have either to remake them, or manufacture them from their own patterns, which is of course expensive.

FIG. 48.



The Valves here offered have their Seatings, Valves, Nuts, Glands, and Spindles up to the 7-inch size, made of the best gun metal. The 7-inch size and upwards have the Spindles of wrought iron, the Nut and Screw being placed outside, as shown in Figs. 47, 49, and 51. The Nuts are properly cut in the Lathe, the Wheels are turned bright, and the Flanges all faced and turned on the edge, and the Valves can therefore be used in any Engine Room, whilst they recommend themselves in every situation where a superior article is required.

By adopting the system of keeping our leading articles of manufacture always in stock and in progress, we are generally able to execute orders for these Valves on receipt.

If Valves are required with Flanges larger in diameter than those given in the List, they are charged extra.

FIG. 47.

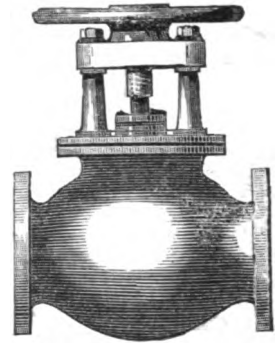
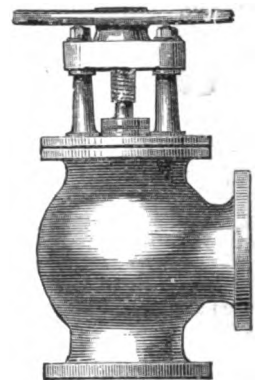


FIG. 49.



## REDUCED PRICE LIST.

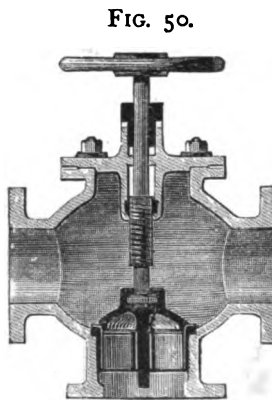
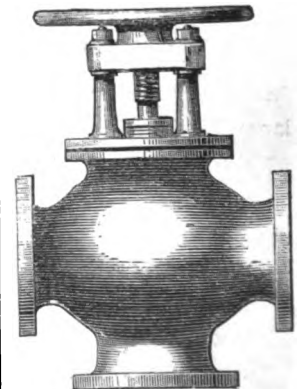


FIG. 50.

Bore.	Dia. of Flange.	Length over Flange, Single way.	Length over Flange, Double way.	Price of Single-way and Elbow Valves.			Price of Double-way Valves.		
inch.	inch.	inch.	inch.	£	s.	d.	£	s.	d.
2	6½	9	10	1	10	0	2	0	0
2½	7	9½	10½	1	17	6	2	10	0
3	7½	10	11	2	7	6	3	5	0
3½	8	12	13	3	0	0	4	0	0
4	9	14	15	3	15	0	4	15	0
5	10	16	18	4	10	0	6	0	0
6	12	18	20	5	10	0	8	0	0
7	13½	18	20	6	15	0	9	5	0
8	14	20	22	8	10	0	9	10	0
9	15½	22	24	10	0	0	12	10	0
10	17	23	26	12	10	0	15	0	0
12	19	26	30	16	10	0	18	10	0

FIG. 51.

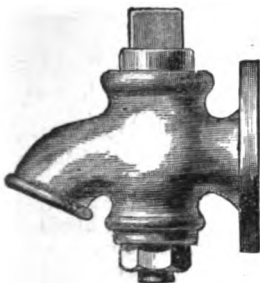
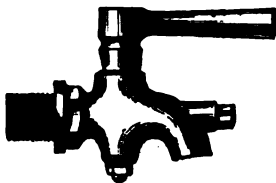
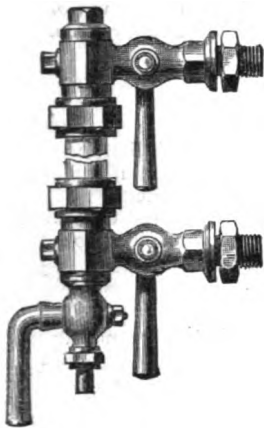
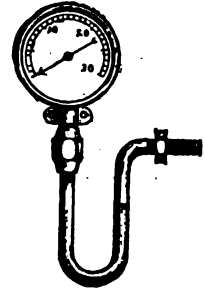
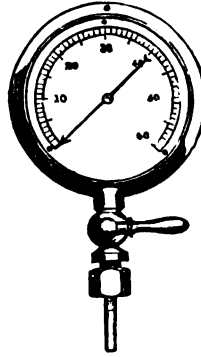
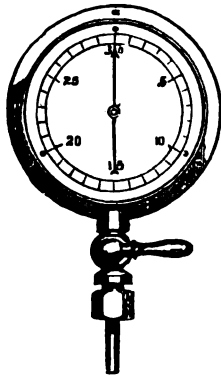
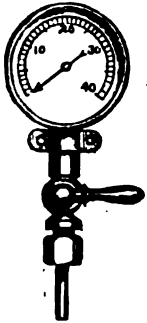


Valves with unturned Wheels and Flanges, a facing strip forming the joint, are 15 per cent. less than the above.

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## PRESSURE GAUGES.



Diam. of Dial		3"	4"	5"	6"	7"
Price .. ..		16 0	16 6	19 0	22 6	25 0
Extra for Cock		3 0	3 0	3 6	4 0	4 6

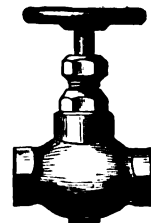
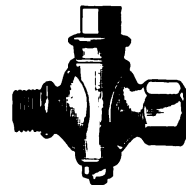
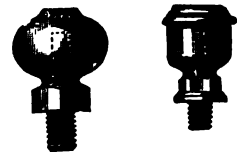
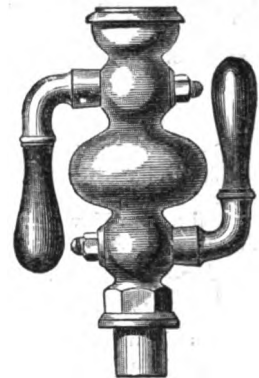
GLASS GAUGES.			DOUBLE GREASE CUPS.		
Diam.	Price.	With Flanges.	Diam.	Price.	With Flanges.
inches.	s. d.	s. d.	inches.	s. d.	s. d.
$\frac{3}{8}$	22 0	28 6	$1\frac{1}{4}$	5 0	6 3
$\frac{1}{2}$	23 0	29 6	$1\frac{1}{2}$	5 9	7 0
$\frac{3}{4}$	27 6	34 6	$1\frac{3}{4}$	6 6	8 0
$\frac{1}{1}$	37 6	45 0	2	7 0	8 6
$\frac{1}{1}$	40 0	48 0	$2\frac{1}{2}$	12 0	14 0
$1\frac{1}{2}$	50 0	58 0	3	15 9	18 6

GAUGE COCKS.			OIL CUPS.		
Diam.	Price.	With Flanges.	Diam.	Price.	With Flanges.
inches.	s. d.	s. d.	inches.	s. d.	s. d.
$\frac{3}{8}$	3 3	4 2	$\frac{3}{8}$	1 0	..
$\frac{1}{2}$	4 0	5 0	$\frac{1}{2}$	1 2	..
$\frac{3}{4}$	4 9	6 0	$1\frac{1}{4}$	1 6	2 9
$\frac{1}{1}$	5 6	6 10	$1\frac{1}{2}$	2 0	3 3
$\frac{1}{1}$	7 0	8 6			
$\frac{1}{1}$	9 0	10 9			
$1\frac{1}{2}$	11 0	13 0			

BLOW-OFF COCKS.			STEAM VALVES.		
Diam.	Price.	With Flanges.	Diam.	Price.	With Flanges.
inches.	s. d.	s. d.	inches.	s. d.	s. d.
$\frac{3}{8}$	7 6	9 0	$\frac{1}{4}$	5 3	8 9
$\frac{1}{2}$	10 6	12 6	$\frac{3}{8}$	8 0	10 6
$\frac{3}{4}$	15 0	18 0	$\frac{1}{2}$	11 0	15 0
$\frac{1}{1}$	21 0	25 0	$\frac{3}{4}$	14 6	22 0
$1\frac{1}{2}$	25 0	28 0	$1\frac{1}{4}$	19 6	28 0
2	37 0	42 0	2	31 0	42 0



ALEX. WILSON AND CO.,  
ENGINEERS, VAUXHALL IRON-WORKS, NINE ELMS, LONDON, S.W.

## REFERENCES.

*Our Pumps and other Manufactures are used by the following Public Departments, Companies, and Engineering Firms, selected from a List too numerous to publish.*

The Admiralty.  
The War Department.  
The India Office.  
The Crown Office of Colonies.

The Queensland Government.  
The Trinity House.  
The Mersey Docks Board.  
The River Wear Commissioners.

The Commissioners of Leith Docks.  
The Jersey Harbour Commissioners.  
The Cork Harbour            "  
The Tees Conservancy        "

### RAILWAY COMPANIES.

Great Western Railway Co.  
London and North-Western Railway Co.

North-Eastern Railway Co.  
London and South-Western Railway Co.

Great Eastern Railway Co.  
South-Eastern Railway Co.

### STEAM-SHIP COMPANIES AND OWNERS.

Pacific Steam Navigation Co.  
British India Steam Navigation Co.  
General Steam Navigation Co.  
White Star S.S. Co.

Russian Steam Navigation Co.  
Compagnie Transatlantique.  
Malcolmson, Bros., Waterford.  
British and Irish Steam-Packet Co.  
Dublin and Liverpool S.S. Co.

Baltischer Lloyd, Stettin.  
Bailey and Leetham, Hull.  
Currie and Co., Leith.  
R. MacAndrew and Co., London.  
Ismay and Co., Liverpool.

### MARINE ENGINEERS AND SHIPBUILDERS.

Thames Iron-Works and Shipbuilding Co., Limited.  
J. and G. Rennie, London.  
Humphreys and Tennant, Deptford.  
Ravenhill, Eastons, and Co., London.  
Samuda, Brothers, Poplar.  
J. and W. Dudgeon, Millwall.  
Westwood, Baillie, and Co., Poplar.  
S. Hodge and Sons, Millwall.  
Millwall Docks Engineering Co., Limited.  
John Stewart, Blackwall.  
Victoria Docks Engine-Works Co., Limited.  
Wm. Walker and Co., Deptford Green.  
Laird, Brothers, Birkenhead.

Thos. Brassey and Co., Birkenhead.  
Geo. Forrester and Co., Liverpool.  
Hamilton's Windsor Iron-Works, Limited, Liverpool.  
Milford Haven Engineering and Shipbuilding Co., Limited.  
James Watt and Co., Soho.  
Sir W. G. Armstrong and Co., Elswick.  
Palmers and Co., Limited, Jarrow.  
R. and W. Hawthorn, Newcastle.  
R. Napier and Sons, Glasgow.  
Aitken and Mansel, Glasgow.  
Blackwood and Gordon, Port Glasgow.  
Robert Duncan and Co., Port Glasgow.  
Rankin and Blackmore, Greenock.

Steele and Co., Greenock.  
Hawthorns and Co., Leith.  
Hall, Russell, and Co., Aberdeen.  
Cork Harbour Docks Co., Limited.  
Courtney, Stephens, and Co., Dublin.  
Harland and Wolff, Belfast.  
Société Anonyme Nouvelle des Forges et Chantiers de la Méditerranée, Havre.  
Société Anonyme des Navales Constructions, Havre.  
Arman Père, Bordeaux.  
A. Normand, Havre.  
W. C. and K. De Wit, Amsterdam.  
Rostocker Actien Gesellschaft für Schiff und Maschinenbau.

### GENERAL ENGINEERS.

George Adlam and Sons, Bristol.  
H. Alexander and Son, Cirencester.  
W. Allchin and Son, Northampton.  
John Abbot and Co., Limited, Gateshead.  
H. T. Balfour and Co., London.  
Barnes, Fletcher, and Co., Liverpool.  
Bells, Goodman, and Co., Gateshead.

Blackwood and Wood, Liverpool.  
Claridge, North, and Co., Bilston.  
Clayton and Shuttleworth, Lincoln.  
V. and D. Coates, Belfast.  
Crawhall and Campbell, Glasgow.  
J. and T. Dale, Kirkcaldy.  
Davey, Paxman, and Co., Colchester.  
Eastons and Anderson, London.

Edwards and Symes, Cubitt Town.  
Emerson, Murgatroyd, and Co., Stockport.  
Fielding and Platt, Gloucester.  
G. Fletcher and Co., London and Derby.  
Forrest and Barr, Glasgow.  
John Fowler and Co., Leeds.  
Fraser, Bros., London.

## ALEX. WILSON AND CO.,

ENGINEERS, VAUXHALL IRON-WORKS, NINE ELMS, LONDON, S.W.



GENERAL ENGINEERS—*continued.*

Galloway, W. and J., Manchester.  
 W. and J. Garforth, Manchester.  
 R. Garrett and Sons, Suffolk.  
 Gilkes, Wilson, Pease, and Co.,  
 Middlesboro'.  
 Hayward, Tyler, and Co., London.  
 Head, Wrightson, and Co., Stock-  
 ton-on-Tees.  
 Hicks, Hargreaves, and Co., Bolton.  
 C. D. Holmes and Co., Hull.  
 Henry Hughes and Co., Lough-  
 borough.  
 Manlove, Alliott, and Co., Notting-  
 ham.  
 Marshall, Osborne, and Co., South  
 Shields.

Marshall, Sons, and Co., Limited,  
 Gainsborough.  
 Platt, Bros., and Co., Limited, Old-  
 ham.  
 Plenty and Sons, Newbury.  
 C. Powis and Co., London.  
 A. Ransome and Co., Chelsea.  
 Reading Iron-Works Co., Limited,  
 Reading.  
 Robey and Co., Limited, Lincoln.  
 Ross, Murray, and Co., Dublin.  
 Jas. Rowan and Sons, Belfast.  
 C. Russell and Co., London.  
 Ruston, Proctor, and Co., Lincoln.  
 A. Shanks and Sons, Arbroath and  
 London.

Shand, Mason, and Co., London.  
 Siemens, Bros., London.  
 Simpson and Co., London.  
 Stothert and Pitt, Bath.  
 Tangye, Bros., Birmingham.  
 J. T. Thornycroft and Co., London.  
 Umpherston and Co., Leith.  
 Vicarys and Robertson, Exeter.  
 R. Waygood and Co., London.  
 Willoughby, Bros., Plymouth.  
 J. H. Wilson and Co., Liverpool.  
 Wimshurst, Hollick, and Co., Lon-  
 don.  
 Yarrow and Hedley, London.

## COLLIERIES, IRON-WORKS, &amp;c.

Abergavenny Iron Co., Aber-  
 gavenny.  
 Ansley Hall Coal Co., Warwick-  
 shire.  
 Barrow Hematite Steel Co., Barrow-  
 in-Furness.  
 Blaenavon Iron Co., Newport.  
 Bridgewater Smelting Co., St.  
 Helens.  
 Brynmaur Coal and Iron Co., New-  
 port.  
 Thomas Butlin and Co., Welling-  
 borough.  
 Calchog and Northop Colliery Co.  
 Cannock and Rugeley Colliery Co.,  
 Limited.  
 Thos. Checkley, Walsall.  
 Coanwood Coal Co., Haltwhistle.  
 Compagnie Belge, Brussels.

Dalkeith Collieries, Dalkeith.  
 Duffryn Main Colliery Co., Wales.  
 East Cannock Colliery Co., Walsall.  
 Fried Krupp and Co., Essex.  
 Frodringham Iron-Works Co., Brigg.  
 Furness Iron and Steel Co., Askam-  
 in-Furness.  
 Griffiths, Bros., Mold.  
 Kilmersdon Colliery Co., Radstock.  
 Lambton Collieries, Fence Houses.  
 Landore Steel Co., Swansea.  
 Lawton and Harecastle Colliery Co.,  
 Stoke-on-Trent.  
 Lochgelly Iron and Coal Co., Fife-  
 shire.  
 Lochore and Capeldrae Cannel Coal  
 Co., Lochgelly.  
 Loftus Iron Co., Saltburn-by-the-  
 Sea.

Londonderry Colliery, Seaham Har-  
 bour.  
 Marychurch and Son, Glamorgan.  
 Pease, Hutchinson, and Co., Dar-  
 lington.  
 Pelsall Coal and Iron Co., Walsall.  
 Price, Dixon, and Co., Workington.  
 Shotts Iron Co., Motherwell.  
 H. K. Spark, Workington.  
 Stanton Iron-Works Co., Mansfield.  
 Stapleford Colliery Co., Nottingham.  
 Stockingford Colliery Co., Nuneaton.  
 Stockton Forge Co., Stockton-on-  
 Tees.  
 Threapthwaite Coal Co., Carnforth.  
 Thos. Vaughan and Co., Stockton.  
 West Yorkshire Iron and Coal Co.,  
 near Leeds.  
 Winby, Bros., Cardiff.

## CHEMICAL WORKS.

John Bevan, Llanelly.  
 Bradburn and Co., Wednesfield.  
 Cannock Chase Chemical Works,  
 Lichfield.  
 A. J. Dickenson and Co., Deptford.  
 East London Saltpetre Works Co.,  
 Limehouse.  
 John Hutchinson and Co., Widnes.

Wm. Houlder, Sons, and Co.,  
 Southall.  
 Jarrow Chemical Works, South  
 Shields.  
 Johnson, Matthey, and Co., Hatton  
 Garden.  
 Lawes Chemical Manure Co.,  
 Limited, London.

Muspratt and Sons, Widnes.  
 Robinson and Co., Portsea.  
 W. S. Squire and Co., London.  
 Tyne Chemical Works, South  
 Shields.  
 Hugh Wallace and Co., London.

## GAS AND WATER COMPANIES.

Bergen Gas-Works, Norway.  
 British Gaslight Co., Hull.  
 Dewsbury Gaslight Co.  
 East London Water-Works.  
 Imperial Gaslight Co., London.

London Gas Co.  
 Northampton Gaslight Co.  
 Nottingham Water-Works Co.  
 Oxford Gaslight Co.  
 Phoenix Gaslight Co., London.

Rio de Janeiro Gas Co.  
 Runcorn Water-Works Co.  
 Wandsworth and Putney Gas Co.

## BREWERS AND DISTILLERS.

H. K. Aspinall, Wrexham.  
 City of Dublin Brewery Co.  
 J. W. Clinch, Douglas.  
 Daun and Vallentin, London.

Ind, Coope, and Co., Romford.  
 H. Kemp and Co., Brading, I. W.  
 John Lovibond and Sons, Green-  
 wich.

J. and G. Pendreigh, Edinburgh.  
 George Roe and Co., Dublin.  
 Wm. Smyth and Co., Ardrishaig.  
 Taylor and Co., Chelsea.

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